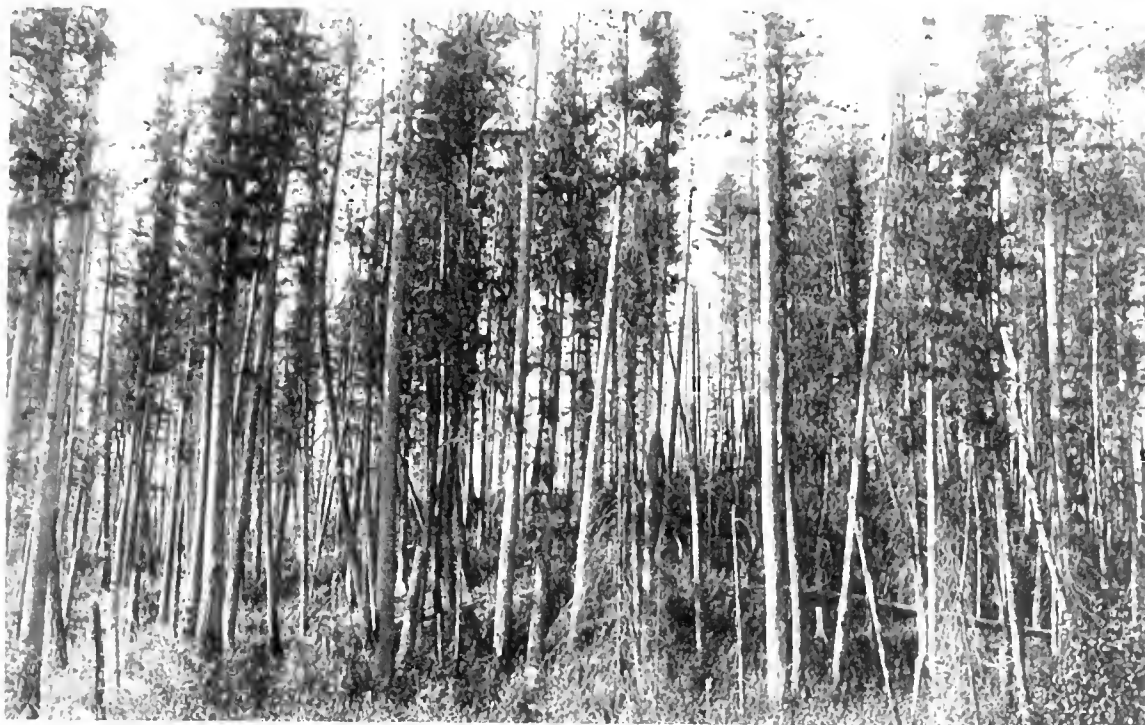


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## LOST BEAR TIMBER SALE ENVIRONMENTAL ASSESSMENT



Montana Department of Natural Resources and Conservation  
Southwestern Land Office  
Clearwater Unit

April, 2003

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# FINDING

## LOST BEAR TIMBER SALE

An Environmental Assessment (EA) has been completed for the proposed Department of Natural Resources and Conservation (DNRC) Lost Bear Timber Sale. After a thorough review of the EA, project file, public correspondence, Department Policies, standards and guidelines, and the State Forest Land Management Plan (SFLMP), I have made the following 3 decisions:

### 1. ALTERNATIVE SELECTED

Two alternatives are presented and were fully analyzed in the EA: The No-Action Alternative, which includes existing activities, but does not include a timber sale (EA, page 3); and the proposed action which proposes harvesting an estimated 3 million board feet (MMBF) of timber from approximately 677 acres and construction of about 2.6 miles of new road. Additionally, approximately 7.1 miles of existing road would be improved to BMP standards. Area roads would be treated with herbicide to control weeds. Logging slash would be treated through such means as prescribed burning. Western larch and ponderosa pine tree seedlings would be planted in suitable areas within section 36. *(EA, page 1, Type and Purpose of Action and, Pages, 3-4, #3, Alternatives Considered, Action Alternative).*

For the following reasons, I have selected the proposed action without additional modifications:

- a. In my opinion, the proposed action best meets the purpose and need for action and the specific project objectives listed in the EA on pages 1-2. The proposed action generates more return to the school trust than the no action alternative. The environmental effects of the proposed action are acceptable as compared to the no-action alternative. No major losses in habitat, or unacceptable effects to water or soil would occur under the proposed action.
- b. The analysis of identified issues did not reveal information compelling the DNRC not to implement the proposed action.
- c. The proposed action includes activities to address environmental concerns expressed by DNRC staff and the public. For example, it includes improvements to the roads in the project area to meet Best Management Practices (BMPs) *(EA, Page 5, Water Quality Existing Conditions and Beneficial Uses, and Effects on Water Quality).*

### 2. SIGNIFICANCE IMPACTS



For the following reasons, I find the proposed action would not have significant impacts on the human environment:

**a. Wildlife**

The project area is used extensively by elk, white tailed deer, mule deer, and moose. With mitigations in place, little to low negative direct, indirect or cumulative effects to big game populations would be expected with the proposed action (*Attachment D, Page 3, II, Description of Relevant Affected Resources, A. Existing Environment, Big Game Considerations, Project Area, and Pages 8-9, IV, Environmental Consequences*).

Recent findings, have detected grizzly bears within the analysis area and mitigations to potential adverse impacts are in place (*Attachment D, Page 3, II, B., Existing Environment, Grizzly Bears and pages 9-11, IV, Environmental Consequences by Resource, Effects Upon Driver Issues, Grizzly Bears*).

Potential habitat for Lynx has been identified within the project area and mitigations to potential adverse impacts are in place (*Attachment D, Page 4, II, C., Existing Environment, Lynx and page 11, IV, Environmental Consequences by Resource, Effects Upon Driver Issues, Lynx*).

Gray wolves could use the analysis area however; there would be low potential for direct, indirect or cumulative effects (*Attachment D, Page 2, II, B., Existing Environment, Wolves and pages 12-13, IV, Environmental Consequences by Resource, Effects Upon Driver Issues, Gray Wolf*).

**b. Economics**

This alternative would provide the largest measure of reasonable and legitimate return over the long run for the Public Buildings (P.B.) and Common School (C.S.) grants. Under the selected alternative, trust revenues from stumpage would be between approximately \$345,000 and 747,000 (*EA, #24, Page.13 and Attachment E*). With a well designed and maintained access/transportation route, this would provide for future entries at reduced costs and anticipated higher stumpage values.

**c. Water Quality, Fisheries and Soils**

A small watershed yield increase would be anticipated in a small tributary to Bear Creek. Stream channel conditions would accommodate this level of water yield increase and no cumulative watershed impacts would be expected. No cumulative watershed impacts due to watershed yield increase are anticipated in the Fish Creek watershed. BMPs would be fully complied with during harvest operations (*EA, Page 5, #5, Water Quality, Quantity and Distribution, Cumulative Watershed Effects, and Attachment C, Page 3, Effects on Water Quality, Action*



*Alternative, and Effects on Water Quality, Action Alternative, and Pages 3-5, Cumulative Watershed Effects).*

There are no harvest units located immediately adjacent to Bear Creek or Fish Creek. There is a sufficient buffer between all proposed harvest units and stream channels draining into the proposed project area. Best Management Practices and Streamside Management Zone Laws and Rules would be implemented. No direct, indirect or cumulative impacts to cold water fisheries habitat would be expected to occur (*Attachment C, Pages 5-6, Fisheries Habitat-Effects of Proposed Action, Action Alternative*).

Cumulative effects to soils can occur from repeated entries into the harvest area. Skidding and slash disposal mitigation measures will limit the area impacted and therefore present low risk of cumulative effects assuming future stand entries would likely use existing trails and landings (*EA, Page 4, #4, Geology, and Soil Quality, Stability and Moisture, harvest design mitigation measures, and Attachment B, Page 3, Cumulative effects to soil productivity*).

#### **d. Timber and Site Productivity**

Soil productivity would be protected through mitigations such as skidding restrictions and leaving at least 10-15 tons of large woody debris per acre (*EA, Page 4, #4, Geology, and Soil Quality, Stability and Moisture, harvest design mitigation measures*). Proposed silvicultural treatments would increase stand health and future productivity (*EA, Page 6, #7, Vegetation Cover, Quantity and Quality*).

#### **c. Precedent Setting and Cumulative Impacts**

The proposed timber sale is similar to past projects that have occurred in the analysis area. Since the EA does not identify future actions that are new or unusual, the proposed timber sale is not setting a precedent for future action with significant impacts.

Taken individually and cumulatively, the identified impacts of the proposed timber sale are within acceptable limits (*Reference, EA and EA, Attachments B, C, D and E*). Proposed timber sale activities would not be conducted on important, fragile, or unique sites.

The proposed timber sale conforms with the management philosophy adopted by the DNRC in the SFLMP and is in compliance with existing laws, policies, guidelines, and standards applicable to this type of proposed action.

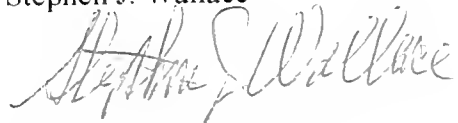


### **3. SHOULD DNRC PREPARE AN ENVIRONMENTAL IMPACT STATEMENT (EIS)?**

Based on the following, I find that an EIS does not need to be prepared:

- a. The EA completely addressed the issues identified during project development and displayed the information needed to make the decisions.
- b. Evaluation of the potential impacts of the proposed timber sale indicates that no significant impacts would occur.
- c. Sufficient opportunities for DNRC staff and public review and comment during project development and analysis were provided. DNRC staff and public concerns were incorporated into the project design and analysis of impacts.

Stephen J. Wallace



Clearwater Unit Manager  
Southwestern Land Office  
April 8, 2003



# ENVIRONMENTAL ASSESSMENT

## Introduction and Overview

**Project Name:** Lost Bear Timber Sale

**Proposed Implementation Date:** Summer, 2003 through approximately 2008

**Location:** Sections 14 and 36, Township 14 North, Range 14 West, Missoula County, Montana (*see figure # A – 1, Vicinity Map*)

### **Type and Purpose of Action**

The Montana Department of Natural Resources and Conservation (DNRC) proposes to harvest an estimated 3 million board feet (MMBF) of timber from approximately 677 acres. This would include constructing an estimated 2.6 miles of new road to access these areas of state trust land in sections 14 and 36, Township 14 North, Range 14 West in Missoula County. Additionally, an estimated 7.1 miles of existing road, mostly within these same two sections would be improved to BMP standards. Receipts generated by this proposal would yield between an estimated \$345,000 and \$747,000 for the common schools and public building trust funds. The proposed harvest treatments would emulate disturbances caused by natural wildfire events and increase stand health and productivity. Area roads would be treated with herbicide to control noxious weeds. Western larch and ponderosa pine tree seedlings would be planted in suitable areas within section 36.

The lands involved in this proposed project are held by the State of Montana in trust for the support of specific beneficiary institutions such as public schools & state colleges (Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11). The Board of Land Commissioners and Department of Natural Resources and Conservation (DNRC) are required by law to administer these trust lands to produce the largest measure of reasonable and legitimate return over the long run for these beneficiary institutions (Section 7 – 1–202, MCA).

In 1996, the DNRC adopted the State Forest Land Management Plan, (SFLMP) under an Environmental Impact Statement Record of Decision and subsequent approval by the board of land commissioners. The SFLMP outlines the management philosophy for forested State trust lands. This project is conceived and proposed in accordance with the direction provided by the State Forest Land Management Plan.

The objectives of the project are to:

- 1) Generate revenue for the common schools and public building trust funds,



- 2) Reduce the threat of catastrophic wildfire by moving the treated stands towards a more desired future condition. These treated stands would begin to emulate pre-settlement (prior to wildfire suppression) stands, or would be one step closer to historic conditions.
- 3) Increase residual tree vigor,
- 4) Reduce the susceptibility of residual trees to epidemic insect and disease infestations and outbreaks,
- 5) Promote some tree regeneration both naturally and artificially,
- 6) Help control the spread of noxious weeds in the project area.

## **I. Project Development**

### **1. Public Involvement, Agencies, Groups or Individuals Contacted**

Public involvement has been solicited through notices mailed during June of 1999 to interested parties and also involved some personal contacts. Changes have been made to the initial project proposal. These changes include: estimates of harvest volume, distances of new road construction and existing road re-construction, and the anticipated implementation and completion dates. The change to the proposed implementation dates was made due mostly to changes in unit personnel and an elevated urgency to prepare other timber sales elsewhere including the salvage of fire and insect damaged timber. The change to the proposed harvest volume estimate was made due mostly to availability during the interim of more up-to date stand data. The changes in the distance of new road construction and existing road re-construction were influenced somewhat by an interim decision altering the transportation route for long-term forest management efficiency. The over-all scope and intent of the original proposal has remained consistent throughout. The project file contains comments received from notices mailed in regards to a similar proposed timber sale project during 1995 that was not implemented. Similar to the changing 1999 proposed implementation dates, this project was not implemented due mostly to changes in unit personnel, prioritizing timber sales in other locations including the salvage of fire and insect damaged timber as well as a desire to slightly alter proposal objectives. (*Reference - Lost Bear Timber Sale Project File, DNRC, Clearwater Unit Office*)

Those who provided input and / or comments during project development include:

#### DNRC program officials and specialists:

Gary Frank and Renee Hanah, Hydrologists, Jeff Collins, Soil Scientist, Rose Leach and Mike McGrath, Wildlife Biologists, Patrick Rennie, Archeologist, and various DNRC program officials.



Public:

Bill Potter of the E Bar L Ranch (neighboring landowner), and Milo Burcham, Research Biologist from the University of Montana

Other interested parties:

The Alliance for the Wild Rockies and The Montana Natural Heritage Program

The project area has no motorized vehicle access to the public. All comments have been considered during project development. The department has developed the project in accordance with the State Forest Land Management Plan.

## **2. Other Governmental Agencies with Jurisdiction – Permits Needed**

The Montana DFWP will issue the required 124 Stream Preservation Act permits. The United States Bureau of Land Management (BLM) will issue a Temporary Right-of-Way Permit.

## **3. Alternatives Considered**

### **No-Action Alternative**

Wildfires would continue to be suppressed. The harvesting of timber would be deferred at this time. The affects of continuing wildfire suppression and deferring the harvest of timber at this time would allow existing concentrations of ladder fuels and over-stocked stand conditions to continue to increase, elevating the potential for catastrophic wildfire. Additionally, tree susceptibility to insect attacks and disease outbreaks would continue to increase. Timber stand health and productivity would not be allowed to increase. No revenue would be generated from the sale of forest products at this time. Existing, substandard roads would continue to degenerate and impact water and soil quality primarily through sedimentation and erosion. (*See Attachment C, page 3, Effects on Water Quality, No Action Alternative and, Attachment B, page 2, Environmental Effects on Soils*). Existing populations of noxious weeds would continue to spread on drier habitats (*Attachment B, page 4, Existing Noxious Weeds*). Livestock grazing would continue under grazing license # 3062830 in section 14. Fisheries habitat, wildlife and wildlife habitat would see little to no changes as long as wildfires are excluded (*Attachment C, page 5, Fisheries Habitat-Effects of Proposed Action, No Action Alternative and Attachment D, Chapter IV, P. 8, Environmental Consequences by Resource*). Existing, non-regenerated areas in section 36 would remain.

### **Action Alternative**

Wildfires would continue to be suppressed. An estimated 3 million board feet (MMBF) of timber would be harvested from approximately 677 acres. The proposed harvest treatments would emulate disturbances caused by natural wildfire events and increase



stand health and productivity. An estimated \$345,000 - \$747,000 would be generated for the public building and common schools trusts from the sale of forest products. An estimated 0.7 miles of new road would be constructed to BMP standards in section 14 and 1.9 miles in section 36; both of Township 14 North, Range 14 West. The total amount of new road construction would be approximately 2.6 miles. Additionally, an estimated 7.1 miles of existing road, mostly within these same two sections would be improved to BMP standards. Area roads would be treated with herbicide to control noxious weeds. Logging slash would be treated through such means as prescribed burning. Western larch and ponderosa pine tree seedlings would be planted in suitable areas within section 36. Livestock grazing would continue under grazing license # 3062830 in section 14.

## **II. Impacts on the Physical Environment**

### **4. Geology and Soil Quality, Stability and Moisture**

#### Soil concerns and potential issues to be considered:

\* Equipment operations during timber harvest on wet sites or sensitive soils can result in soil rutting, compaction, displacement and erosion. Long-term soil productivity can be reduced depending on area and degree of physical effects, amount and distribution of coarse woody debris retained for nutrient cycling.

\* Adequate road drainage, proper construction and reconstruction according to BMP's and maintenance needs on existing roads.

#### Harvest design mitigation measures:

Potential soil impacts can be avoided or reduced to acceptable levels by implementation of BMP'S and the following recommendations:

\* Tractor skidding would be limited to slopes less than 40% on the granitic Ambrandt, Elkner and Ovando soils in section 14. The logger and sale administrator will agree to a general skidding plan prior to equipment operations to limit area in trails and protect residual trees. Skid trails would be designated on steeper portions of units. Existing skid trails would be used wherever possible. Skidding would be limited to 45% on all other sites.

\* Equipment operations would be limited to periods when soils are relatively dry, (less than 20%) to minimize soil compaction, rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up. Some moister conditions are accepted on harvest units where tractors remain on designated trails and timber will be winched to trails.

\* Localized moist sites within harvest units would be protected by equipment restriction zones where needed and winch trees out.



\* Slash Disposal- Harvest and slash disposal treatments would retain 10-15 tons/acre large woody debris and a majority of fine slash well distributed for nutrient cycling and long-term productivity. This could be accomplished by in-woods processing or return skidding slash concurrent with harvest operations. On areas of high slash concentration the forest officer would approve the most appropriate treatment from the following options. 1) Lop and scatter slash, 2) excavator pile and redistribute slash as needed on slopes up to 50%. 3) Dozer pile with slash blade on slopes up to 30% using caution to avoid excessive disturbance. On roadside edges (generally 100 feet) DNRC would crush debris or reduce woody debris levels to meet fire safety requirements recognizing a short-term effect on nutrients (*See Attachment B, P. 1, Soil concerns and potential issues to be considered and P. 2-3, Harvest Design Mitigation Measures*).

## **5. Water Quality, Quantity and Distribution**

### Watershed - Existing Conditions

The proposed timber sale is located on two different school trust sections in Bear Creek and Fish Creek and several unnamed tributaries and discontinuous ephemeral draws. There is no direct conveyance of concentrated surface flow from these discontinuous ephemeral draws to the Blackfoot River. Fish creek and Bear Creek are both tributaries to the Blackfoot River. Ownership in these watersheds is a mixture of State Trust Lands, Plum Creek and private.

Direct, indirect and cumulative effects as a result of past management activities are low to moderate. Historic timber harvest has increased water yield. However, existing channel conditions are good within the proposed project area. The stream channel is functioning properly and the banks are well vegetated and stable.

### Cumulative Watershed Effects

No cumulative watershed impacts due to watershed yield increase are anticipated in the Fish Creek watershed. No cumulative watershed impacts are expected in the unnamed tributary to Bear Creek despite a moderate high level of estimated existing water yield increase.

### Water Quality Existing Conditions and Beneficial Uses

Bear Creek and Fish Creek are classified B-1 in the Montana Surface Water Quality Standards. Neither of these streams has been identified as water quality limited water bodies. Appropriate measures would be taken to mitigate potential, adverse affects of the proposed action on water quality, quantity and distribution.

### Effects on Water Quality

#### No Action Alternative



Under the No Action Alternative, existing substandard roads with inadequate surface drainage would continue to impact water quality unless mitigations or remedial actions are taken.

#### Action Alternative

The primary risk to water quality is sediment delivery from roads, especially new road construction or at stream crossings. Under the Action Alternative approximately 1.9 miles of new road is to be constructed in section 36. Section 14 will have approximately 0.7 miles of new road construction. The DNRC would implement reasonable mitigations and erosion control practices during the design and construction of roads and stream crossings.

*(See attachment C, Watershed and Fisheries Report, Pages 1-5).*

## **6. Air Quality**

Federal, state and local agencies enforce rules for open, controlled burning. Air quality is analyzed by estimating emissions from prescribed burns and determining where project related activities would create dust on roads. The air quality analysis area for the proposed action includes all of Missoula County and is located in Montana Air shed 3B. The Montana Air shed group is responsible for determining both air shed number and impact zones. The project area is not located in any of the impact zones.

#### No Action

This alternative would not create impacts to air quality beyond existing levels.

#### Action

The post harvest burning of logging debris would produce particulate matter. All burning would be conducted at times of adequate ventilation and within existing rules and regulations.

#### Cumulative Effects

Cumulative effects to air quality would not exceed the levels defined by State of Montana Cooperative Smoke Management Plan (1988) and managed by the Montana Airshed Group. Prescribed burning on Plum Creek Timber Company lands would have potential to affect air quality. Plum Creek Timber Company currently operates under the same Air shed Group guidelines, as the State would burn only on approved days.

## **7. Vegetation Cover, Quantity and Quality**

No rare plants or cover types listed by the Montana Natural Heritage Program have been identified within the project area. Timber harvesting under the proposed action alternative would alter current stand structures and species composition. Silvicultural



treatments proposed under the action alternative including tree planting would ensure adequate regeneration following harvest.

### Analysis Area

The analysis area for vegetation cover and quality includes all of sections 14, and 36, Township 14 North, Range 14 West and adjacent lands within 1 mile of these sections.

### Existing Stand Conditions

Conditions in both sections (14 and 36) are the result of both natural and man-caused disturbances. Habitat types, local wildfire history and the presence of charred, woody debris suggest stands within these two sections experienced some regular wildfire interval at varying intensities and severities. Additionally, most stands in section 14 were selectively harvested about 47 years ago, while many stands in section 36 were selectively harvested approximately 40 years ago. A concentration of ladder fuels is increasing due to proximity of sapling-sized trees to larger, mature trees. An apparent decrease in vigor of mature trees can be noticed in many areas due to overstocking. This is most visibly evident from tree form characteristics and leader growth. Endemic populations of mountain pine beetle exist in most stands within both sections. While these populations currently pose no eminent threat of widespread damage to the stands, increasing tree vigor would reduce susceptibility in the future.

Within section 14, stand structures generally consist of approximately 12-22" Diameter at Breast Height (DBH), randomly spaced western larch, Douglas-fir, and some ponderosa pine (roughly 35-65 trees per acre on average). Areas within these larger stands also contain individuals, groups, and patches of approximately 6-12" DBH Douglas-fir, ponderosa pine, and western larch (roughly 25-55 trees per acre on average). Individuals and patches of healthy, advanced tree regeneration are common throughout much of the stand area. Much of this regeneration shows signs (such as decreased leader growth) of experiencing decreased vigor through a closed overstory canopy and over-stocking. Shrubs, mostly ninebark (*Physocarpus malvaceus*), occupy many areas within the over-all stand understory.

Within section 36, there is a range of stand structures. Stands mostly on westerly to southerly aspects generally consist of approximately 8-20" DBH Douglas-fir with occasional ponderosa pine trees. Stocking ranges from areas with a relatively closed canopy to fairly open grown, isolated small groups (roughly 60-130 trees per acre on average). There are small patches of healthy tree regeneration as well as openings occupied mostly by grass. Stands on mostly easterly aspects are two distinctly different types. The first stand is made up of fairly dense (roughly 110-170 trees per acre on average) approximately 8-18" DBH Douglas-fir and a scattered mixture of sub-alpine fir and lodgepole pine. Many of the lodgepole pine are disfigured from dwarf mistletoe disease. The other stand is made up almost exclusively of very densely stocked (roughly 170 trees per acre on average), approximately 8-16" DBH lodgepole pine. A few widely



scattered western larch and Douglas-fir are present as well. Both of the last two stands described contain very little understory vegetation.

### No-Action Alternative

Existing concentrations of ladder fuels and over-stocked stand conditions would continue to increase, posing an increasing threat of catastrophic wildfire. Stress caused by over-stocked stand conditions would increase the susceptibility of trees to insect attacks and disease outbreaks. Openings that currently occur in stands 36 – 1 and 36 – 2b would remain un-stocked. Future revenue generating opportunities would also be reduced due to decay and reduced growth potential. Existing populations of noxious weeds would continue to spread on drier habitats (*Attachment B, pages 3- 4, Existing Noxious Weeds*). Livestock grazing would continue under grazing license # 3062830 in section 14.

### Action Alternative

Ten individual stands would undergo silvicultural treatments. These stands are referenced as follows:

14 – 1, 2, 3, and 4 within section 14 and 36 – 1, 2a, 2b, 2c, 2d, and 3 within section 36 (*See figure A – 2, pages 1 and 2*)

Stands 14 – 1, 2, 3, 4 and 36 – 1, 2a, and 2b would be selectively harvested in an attempt to simulate the affects of a moderate severity wildfire event. This type of moderate severity wildfire would be expected to kill mostly smaller sized trees as well as small groups of larger trees. An estimated 30 – 40 square feet of basal area on average would be left in stands 14 – 1, 2, 3, 4, while an estimated 25-50 square feet of basal area would be left in stands 36 – 1, 2a, and 2b. Leave trees would typically be the larger trees and those which display healthy growth characteristics. Seral tree species would be left under most conditions where applicable. Tractor skidding methods would be employed to remove timber. Healthy tree regeneration generally exists in the stands. Regeneration would not be a primary goal of this treatment. Some areas where harvesting disturbance provides for seed germination and sufficient sunlight, some favorable regeneration would be expected to establish. Residual tree growth would be expected to enhance stand health, and promote increased future revenue generating capacity. Sound snags that pose no obvious safety hazard would be left to maintain certain wildlife habitat.

Provisions would be made for the following activities after harvesting these stands:

- \* Ensuring adequate site preparation (primarily consisting of excavator piling and burning slash and reducing shrub competition in stands 14-1, 14-2 and 14-3) is completed.
- \* Planting western larch and / or ponderosa pine seedlings would be made in an effort to regenerate openings primarily in stands 36 – 1 and 2b.



These activities would be accomplished during appropriate conditions following harvest.

Stands 36 – 2c and 2d would be thinned primarily to increase residual tree vigor and reduce the occurrence of dwarf mistletoe. An attempt would be made to simulate the effects of a moderate severity wildfire event. This type of moderate severity wildfire would be similar to that described for stands in section 14 and in stands 36 – 1, 2a, and 2b however, it would burn closer to the ground, and kill trees through basal and root collar scalding. An estimated 30 – 40 square feet of basal area per acre would be left on average. Leave trees would primarily be Douglas-fir with occasional western larch and would occur somewhat uniformly. Leave trees would be those that generally display the healthiest growth characteristics. This treatment would not be intended to promote natural regeneration.

The harvest treatment proposed for stand 36 – 3 would consist of a clear-cut with reserves. This treatment would remove essentially all the lodgepole pine trees and leave all healthy Douglas-fir and western larch trees. This treatment would be intended to simulate the effects of a high severity, stand replacement wildfire event. This type of high severity stand replacement wildfire event would kill all but a few scattered trees with the highest fire resistance. Adjacent un-harvested areas would represent the effects of the varying intensity common to most wildfire events.

Provisions would be made for the following activities after harvest of this stand:

- \* Site preparation; consisting of broadcast burning and / or excavator piling and burning slash.
- \* Planting the treated stand with western larch seedlings.

These activities would be accomplished during appropriate conditions following harvest.

*See figures A-2, pages 1 and 2 for locations of the stands previously described.*

In addition to harvesting, site preparation and planting, herbicide would be applied by a licensed professional according to labeled directions to most roads in the project area and many in the project area vicinity to help control the spread of noxious weeds (*See figure A – 3, Proposed Herbicide Application Map*).

### Cumulative Effects

Plum Creek Timber Company manages most of the adjacent lands within one mile of the project area. These lands have been intensively managed, mostly through selective forms of harvesting. Some of the adjacent lands also support limited livestock grazing. Other adjacent lands are managed by other state and federal agencies. These lands in general, are heavily forested and have had little to no timber harvesting. It is anticipated these activities would continue into the foreseeable future.



Potential negative cumulative effects to vegetation cover and quantity would be mitigated through selective harvest practices, responsible reforestation techniques, and weed control measures. The stands to be treated under the action alternative do not meet the Green et al. (1992) definition of old growth and therefore, pose no risk of cumulative effects to old-growth.

## **8. Terrestrial, Avian and Aquatic Life Habitats**

Appropriate measures would be taken to mitigate potential, adverse affects of the proposed action on terrestrial, avian and aquatic life habitats.

A wildlife analysis was conducted for a variety of terrestrial and avian species and associated habitats. The wildlife species or groups that drove the development of the action alternative include:

Big game – The project area is used extensively by elk, white-tailed deer, mule deer, and moose. Under the action alternative, there would be a cumulative reduction in elk security cover (a low cumulative negative affect). (*Reference – Attachment D, P. 9, Big Game Considerations, Action.*)

Other wildlife species that drove the development of the action alternative were grizzly bears, lynx and gray wolves. (*See also, EA, #9*)

(*For further information on terrestrial and avian wildlife, see Attachment D, Wildlife Analysis*)

The Bear Creek drainage contains Westslope cutthroat, brook, rainbow, and brown trout. No fisheries information was available during analysis for the Fish Creek drainage however; DNRC will assume fish are present in Fish Creek. (*See Attachment C, Watershed and Fisheries Report, page 5, Fisheries Existing Conditions and Fisheries Habitat – Effects of Proposed Action*)

## **9. Unique, Endangered, Fragile or Limited Environmental Resources**

No Threatened, Endangered or Sensitive plant species have been identified within the project area. Additionally, a Montana Natural Heritage Program search found no records of Threatened, Endangered or Sensitive plant species within the proposed project area.

Grizzly bears, lynx and gray wolves (classified as threatened) have some potential to be affected under the action alternative.

Grizzly Bears – The project area is not located within a designated grizzly bear recovery zone. However, the analysis area provides habitat for grizzly bears that have recently moved in to the area. Under the action alternative the analysis and project areas would be relatively secure for grizzly bears due to low open road densities. Also under the action alternative, there would be slight negative



cumulative affects, and a low risk for long-term negative affects to habitats important to Grizzly bears.

Lynx – Suitable habitat types for potential denning and foraging occur in section 36. There would be low potential for the proposed action to impact Lynx with associated mitigations.

Gray Wolves - Gray wolves could use the analysis area however; there would be low potential for direct, indirect or cumulative negative effects to them under the action alternative.

*(For further information on grizzly bears, lynx and gray wolves, see EA, Attachment D, Wildlife analysis)*

Westslope Cutthroat Trout (classified as class A species of special concern in Montana) would be protected under a conservation agreement (*Reference – Attachment C, P. 5, Fisheries Existing Conditions*).

## **10. Historical and Archeological Sites**

A DNRC Archeologist conducted an onsite inspection of section 14, Township 14 North, Range 14 West, and identified no cultural resources. Additionally, the Archeologist consulted with the State Historical Preservation Office (SHPO) during research on section 36, T14 North, Range 14 West. SHPO concurred with DNRC's findings that based largely on the steepness of slope (>30%), no cultural resources would be likely to exist in section 36 and therefore recommended that there will be no effect to cultural resources within the proposed timber sale of potential effect. (*Reference - Patrick Rennie Memo, Lost Bear Timber Sale Project File DNRC, Clearwater Unit Office*)

## **11. Aesthetics**

Proposed harvest units are located on and within geographical features common to the area. Due to topography and mostly selective harvest practices, the action alternative would likely have little adverse impact to aesthetics. A portion of harvest unit 36 – 3 (proposed to be treated by clear-cut with reserves) would be visible at a distance of approximately 6 miles from Montana highway 200. Potential negative impacts associated with this harvest unit on aesthetics would be relatively short-term, as reforestation would be expected to decrease these impacts over time.

## **12. Demands on Environmental Resources of Land, Water Air or Energy**

The proposed action would not use resources that are limited in the area. Other activities nearby are not expected to affect the project. No cumulative impacts are likely to occur as a result of this action.

## **13. Other Environmental Documents Pertinent to the Area**



The Elk 36 Timber Sale EA, was used in developing the Action Alternative for the Lost Bear Timber Sale. Also taken in to account were proposals for the Headquarters and Haywire Wallace Timber Sales. Additionally, the Sunset Hills and Upper Blackfoot Reciprocal Access Agreements and State Grazing License # 3062830 have associated environmental documents, which were referenced during project development.

### **III. Impacts on the Human Population**

#### **14. Human Health and Safety**

Log truck traffic would increase slightly on area roads for the duration of the proposed action. Signs at appropriate locations on secondary public or county roads such as the Sunset Hill Road would be used to warn motorists and local residents.

#### **15. Industrial, Commercial and Agricultural Activities and Production**

The proposed action would lead to a temporary increase in activity during implementation. The proposed action would include logging, log hauling, and associated forest improvement actions.

#### **16. Quantity and Distribution of Employment**

A few seasonal jobs in the local area may be created for the duration of the proposed action.

#### **17. Local and State Tax Base Revenues**

The proposed action has only indirect, limited implications for tax collections.

#### **18. Demand for Government Services**

Aside from contract administration, the impact on government services should be minimal due to the temporary nature of the proposed action.

#### **19. Locally Adopted Environmental Plans and Goals**

In 1996, DNRC began a phased-in implementation of the State Forest Land Management Plan (SFLMP). The SFLMP established the agency's philosophy for the management of forested trust lands. The management direction provided in the SFLMP comprises the framework within which specific project planning and activities take place. The SFLMP philosophy is incorporated in the design of the proposed action.

#### **20. Access to and Quality of Recreational and Wilderness Activities**



The project area receives use by walk-in recreationists. Recreation opportunities would continue under the proposed action

## **21. Density and Distribution of Population and Housing**

The project has no direct implications for density and distribution of population and housing.

## **22. Social Structures and Mores**

The proposed action has no direct implications for social structures and mores.

## **23. Cultural Uniqueness and Diversity**

The proposed project has no direct implications for cultural uniqueness and diversity.

## **24. Other appropriate Social and Economic Circumstances**

Primary costs and benefits of the proposed action may be summarized as follows:

### ***Road Work***

New road construction consisting of excavating a road prism and providing surface drainage as well as re-construction of existing roads consisting of blading and improving surface drainage would be done.

### ***Reforestation***

Current plans estimate the total reforestation costs assumed by DNRC to be approximately \$45,375 (based on current average market costs for tree planting (\$215.00 / acre X 131 acres) and prescribed burning (\$150.00 / acre X 104 acres for broadcast burning and \$10.00 / acre X 161 acres). Other additional associated reforestation costs such as fire-line construction, slash treatment and shrub competition reduction would be assumed by the timber sale purchaser.

### ***Timber harvest***

The estimated stumpage is based on comparable sales analysis. This method compares recent sales to find a market value for stumpage. These sales have very similar species, quality, average diameter, product mix, terrain, date of sale distance from mills, road building and logging systems, term of the sale or anything that could affect a buyer's willingness to pay for stumpage. The estimated stumpage price (\$ / MBF) for the lower end of the range equals approximately \$115.00 (Clearwater River #3 Timber Sale) and conversely, \$249.00 (Cramer Creek Timber Sale) at the upper end of the range. These two comparable timber sales were sold based on tons. Six and one half tons per MBF was used to convert from tons to MBF.

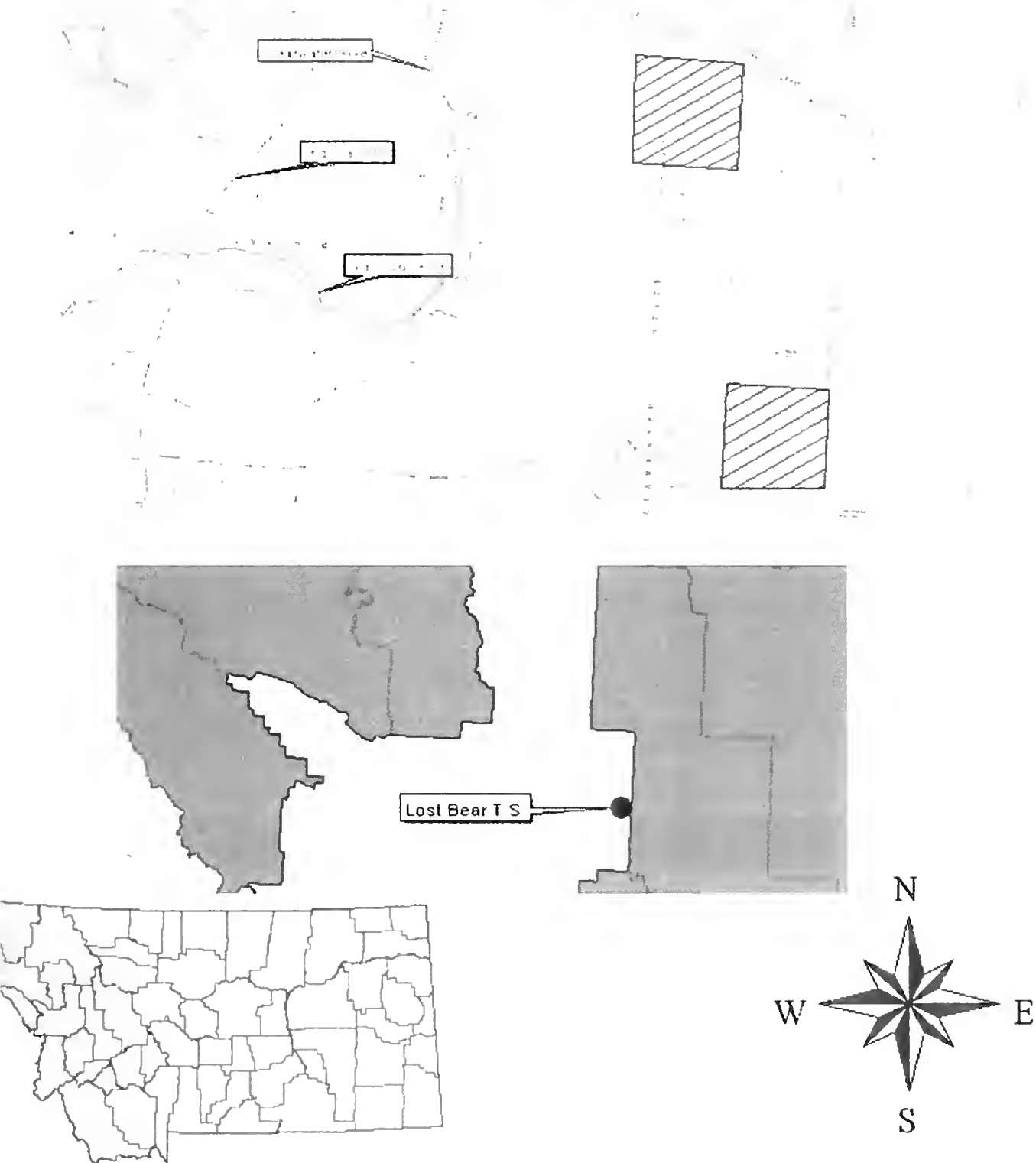


Total revenue from stumpage receipts would yield between \$345,000 and \$747,000 based on the above comparable sales.

*See Attachment E, Economic Analysis for further details regarding economics.*



# Lost Bear T.S. Vicinity Map



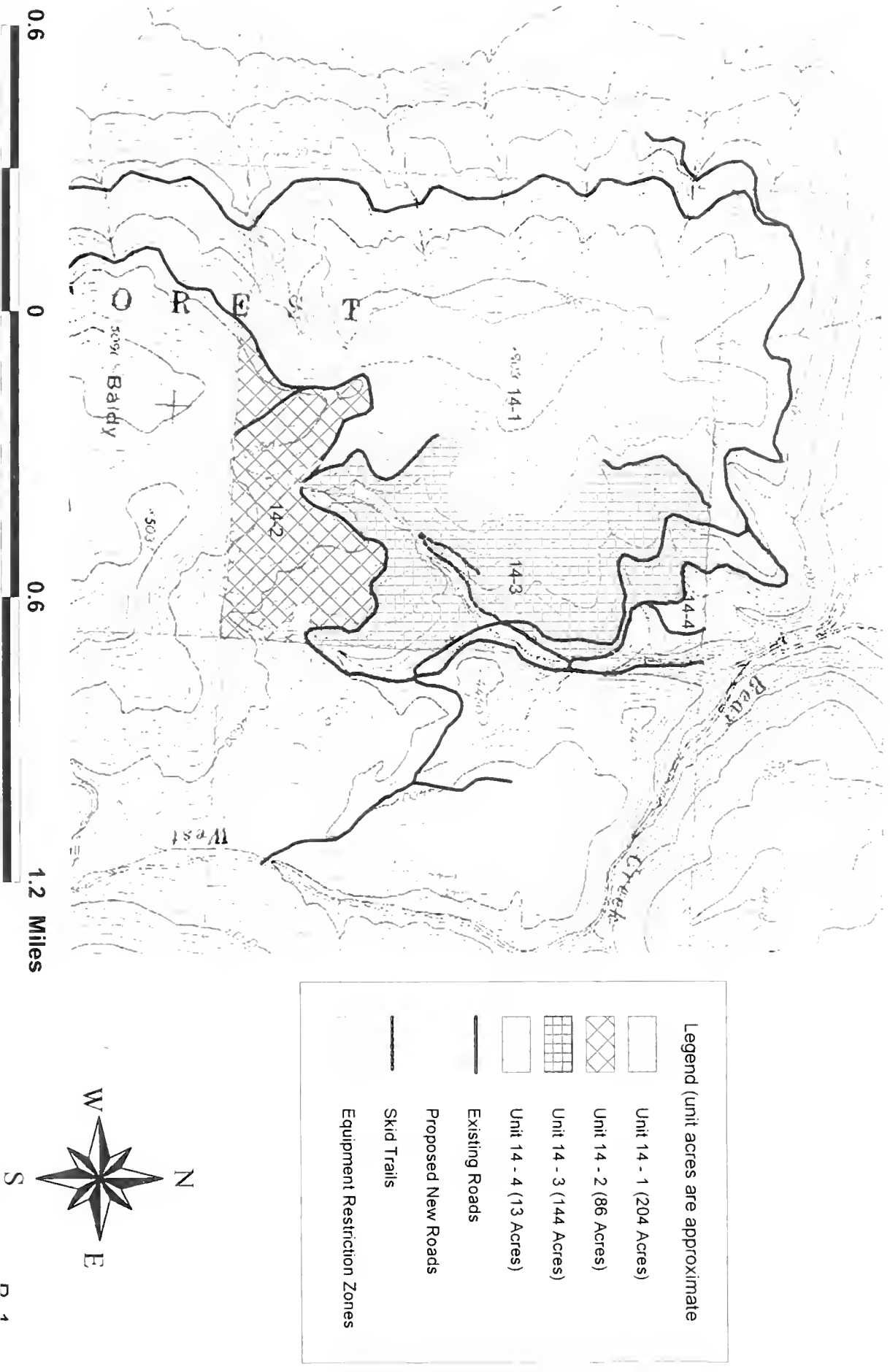


# Lost Bear Timber Sale

Lost Bear Timber Sale EA - Figure A-2

## Proposed Timber Sale Area Map

Section 14, Township 14N, Range 14W



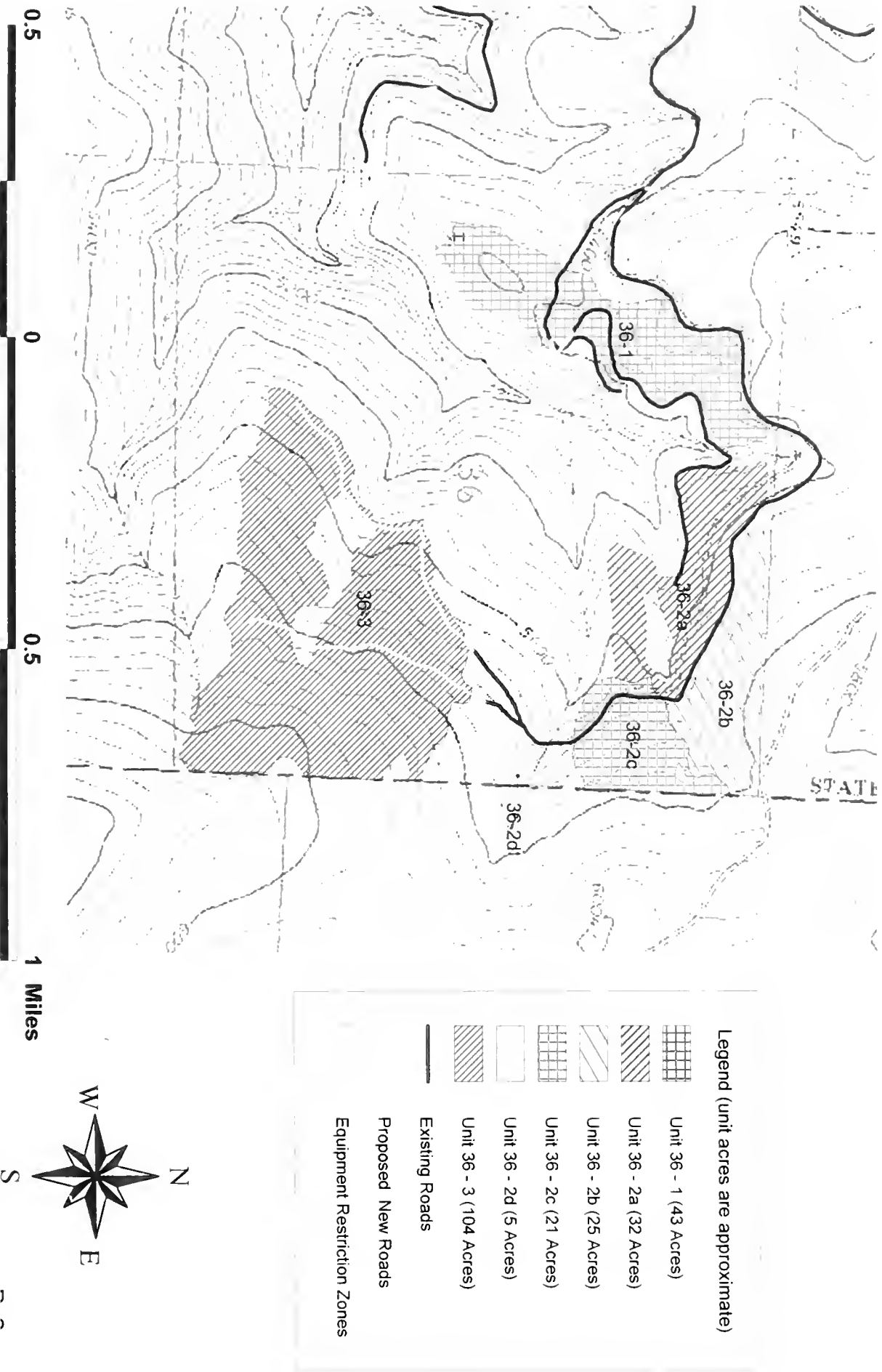


# Lost Bear Timber Sale

## Proposed Timber Sale Area Map

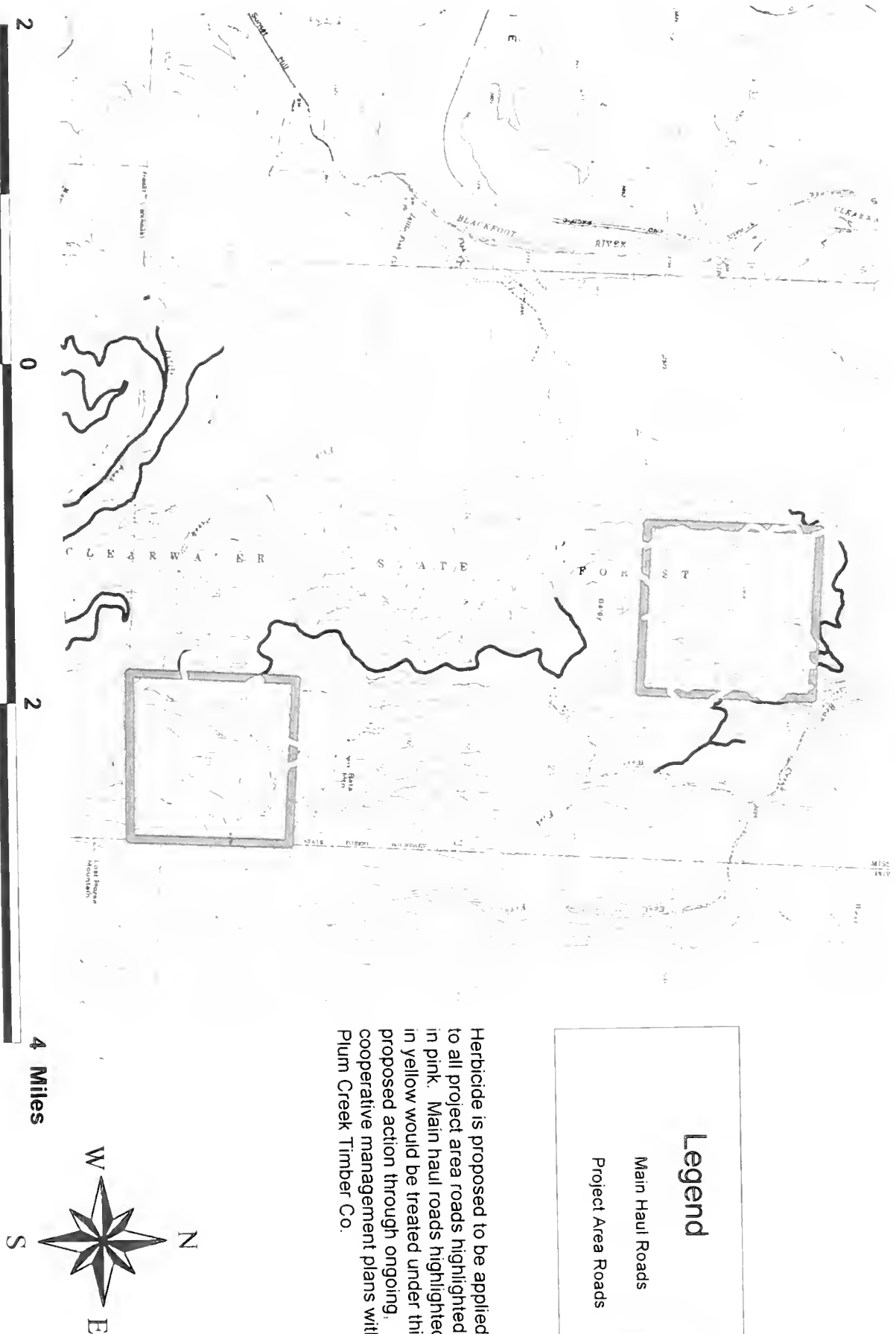
Lost Bear Timber Sale EA - Figure A-2

Section 36, Township 14N, Range 14W





# Lost Bear Timber Sale Proposed Herbicide Application Map (Roads)



Herbicide is proposed to be applied to all project area roads highlighted in pink. Main haul roads highlighted in yellow would be treated under this proposed action through ongoing, cooperative management plans with Plum Creek Timber Co.



October 8, 2002

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**TO:** DAVE MARSH, Forester, Clearwater Unit  
 CRAIG NELSON, Forester, Clearwater Unit  
 STEVE WALLACE, Unit Manager, Clearwater Unit  
 GARY FRANK, Supervisor, Watershed Management Section  
 RENEE HANNA, Hydrologist/Soil Scientist, SWLO

**FROM:** JEFF COLLINS, Soil Scientist

**RE:** LOST BEAR TIMBER SALE Sec. 14 & 36, T14N, R14W

Attached is a revised report on soils on Lost-Bear project area.

**Soil concerns and potential issues to be considered:**

\* Equipment operations during timber harvest on wet sites or sensitive soils can result in soil rutting, compaction, displacement and erosion. Long-term soil productivity can be reduced depending on area and degree of physical effects, amount and distribution of coarse woody debris retained for nutrient cycling.

\* Adequate road drainage, proper construction and reconstruction according to BMP's and maintenance needs on existing roads.

\* Noxious weed spread and encroachment on native plant communities associated with ground disturbance, road construction/ reconstruction, and traffic by trucks and people recreating.

**EXISTING ENVIRONMENT Geology & Soils**

The sale area is located on moderate to steep mountain sideslopes with mainly rocky residual soils derived from belt argillites and quartzites. Granitic bedrock occurs on the east side of section 14. There are no especially unusual or unique geologic features in the sale area. There are no known unstable slopes in the harvest area. Three suitable gravel/borrowl sources were noted in the sale area: 1) an existing borrow site in section 14, and 2) a potential borrow sites in section 36 from the new road construction planned or 3) by widening existing road in east half of section 36. Where gravel is needed it, should be supplied by the contractor from a suitable source.

**SECTION 14, T14N, R14W**

Soils on the west side of the section are mainly Winkler series sandy loam topsoils over very gravelly sandy loam subsoils, which are well drained and droughty. These soils have an early and long season of use. Primary soil concern is potential displacement of shallow surface soils. Erosivity is moderate to low and material quality is good for road construction. Primary soils concerns are avoiding displacement of shallow surface soils during skidding and slash disposal. This site is well suited to tractor operations on slopes up to 45%.

Soils on the east side of section 14 include Ambrandt, Ovando and Elkner gravelly sandy loams derived from granitics. Topsoils are typically 4-6 inches loam with some intermittent volcanic ash surface (mainly on north aspects). These are some of the highest productivity soils within the proposed harvest area. These soils are more erosive and than the Winkler soils and are subject to displacement from equipment operations. Main soil concerns are potential rutting, displacement and erosion, especially on slopes over 40%. The complex terrain on the granitics forms numerous small ridges and draws that limit skid trail locations.

Lower slopes and draws include small areas of Bignell soils on moderate slopes of 15-35%. Bignell soils have gravelly loam topsoils over deep gravelly clay loam subsoils and are well-drained, but remain wet



late into the spring. Erosivity is moderate and can be controlled with standard drainage features. These soils have a limited dry season of use.

### **SECTION 36 T14N, R14W**

Predominate soils in the proposed harvest area are Evaro and Winkler gravelly loams on moderate slopes to steep slopes. Evaro soils have a silt loam volcanic ash surface over deep very gravelly loams from quartzite and argillites. Evaro soils occur mainly on north and easterly aspects and support lodgepole and larch stands in the section. These soils are well drained, but are sensitive to rutting and compaction if operated on in the spring. Winkler soils are similar but without an ash surface and a longer season of use. Primary soils concerns are avoiding compaction and displacement of shallow ash surface soils during skidding and slash disposal. The slopes up to 45% are well suited to tractor operations.

### **ENVIRONMENTAL EFFECTS ON SOILS**

The No-action alternative would have little effect on soil resources. Existing roads with inadequate drainage will continue to erode without maintenance. Existing skid trails that are revegetating, will continue to slowly stabilize.

#### **Harvest Effects of action alternative:**

The primary risks to long-term soil productivity (quality) are erosion, rutting, compaction and displacement of surface soils by equipment operation and road construction.

Equipment operation will be limited to moderate slopes and periods when soils are dry, frozen or snow covered to minimize the area and degree of detrimental soil effects. Wet sites and steep slope will have equipment restriction zones. Erosion on skid trails, landings and roads can be controlled by standard drainage practices.

Cumulative effects can occur from repeated entries into the harvest area. Past harvest in section 36 has left some effect on the soils, with main skid trails still evident. Skidding and slash disposal mitigation measures will limit the area impacted and therefore present low risk of cumulative effects assuming future stand entries would likely use existing trails and landings.

### **HARVEST DESIGN MITIGATION MEASURES:**

Potential soil impacts can be avoided or reduced to acceptable levels by implementation of BMP'S and the following recommendations

- \* Tractor skidding will be limited to slopes less than 40% on the granitic Ambrandt, Elkner and Ovando soils in section 14. The logger and sale administrator will agree to a general skidding plan prior to equipment operations to limit area in trails and protect residual trees. Designate skid trails on steeper portions of units. Use existing trails wherever possible. Skidding will be limited to 45% on all other sites.

- \* Limit equipment operations to periods when soils are relatively dry, (less than 20%) to minimize soil compaction, rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up. Some moister conditions are accepted on harvest units where tractors remain on designated trails and timber will be winched to trails.

- \* Localized moist sites within harvest units will be protected by equipment restriction zones where needed and winch trees out.

- \* Slash Disposal- Harvest and slash disposal treatments will retain 10-15 tons/acre large woody debris and a majority of fine slash well distributed for nutrient cycling and long-term productivity. This can be accomplished by in-woods processing or return skidding slash concurrent with harvest operations. On areas of high slash concentration the forest officer would approve the most appropriate treatment from the following options. 1) Lop and scatter slash, 2) excavator pile and redistribute slash as needed on slopes up to 50%. 3) Dozer pile with slash blade on slopes up to 30% using caution to avoid excessive



disturbance. On roadside edges and near homes (generally 100 feet) DNRC would crush debris or reduce woody debris levels to meet fire safety requirements recognizing a short term effect on nutrients.

#### **Cumulative effects to soil productivity**

**Existing Condition-**Cumulative effects could occur from repeated ground based entries into the harvest area with each entry depending on the area and degree of impacts. Previous harvest built extensive roads and trails in the section that are mostly revegetated. Old trails on ridges and moderate slopes are barely discernable while some of the trails on steeper slopes show sign of ruts and past disturbance that is largely revegetated.

**Action Effects-** The action alternative involves ground skidding that could result in cumulative effects if the area and degree of impacts is not limited. Cumulative effects would be controlled by limiting the area of new detrimental soil impacts to less than 15% of harvest units, by skid trail planning, using existing trails (on suitable locations) and by retaining woody debris and foliage for nutrient cycling. Temporary roads would be stabilized and revegetated. Any future harvest would likely use the same road system and skid trail planning and therefore presents low risk of cumulative effects. Large woody debris will be retained for nutrient cycling and long term productivity and therefore presents modest risk of cumulative effects to soil productivity.

#### **ROADS:**

Most existing access roads can be used as is with some localized repairs, minor relocation and maintenance. Lower slopes on the Sunset Hill access road have segments of clay rich soils of low bearing strength that can be impassable when wet if not graveled, and limit season of use to dry or frozen conditions. Road drainage repairs to existing roads will improve existing conditions, reduce erosion and allow seasonal access to the area. Following use, temporary roads will be closed and have long-term drainage features installed and reseeding with grass.

Exposed bedrock in the southwest corner of the section limits road location, and will require ripping and possibly spot blasting of rock outcrops for road construction. Road is located on best available grade and stable terrain.

Portions of road system in section 14 (such as stream crossings) may require gravel surfacing to reduce rutting and control sediment. Site-specific road drainage needs and spot gravel applications will be addressed in road inventory.

#### **Existing Noxious Weeds**

Knapweed currently occurs along portions of existing roads mainly on road edges and drier southerly slopes across all adjacent land ownerships. Weed spread risk is greater on the west side of section 14 and more open southerly slopes in section 36. Under the no-action alternative, the grazing permittee would be responsible for weed control and weeds would likely slowly increase on drier habitats. New weeds may be introduced by wind or animals.

Under the action alternative ground disturbing activities have the potential to introduce or spread noxious weeds in susceptible habitat types. The following integrated weed management measures would be implemented to prevent new weed establishment and reduce or limit the possible spread of noxious weeds in the project area.

\* During contract period, contractor may be required to control noxious weeds on spot locations as designated by forest officer in charge. Any weed treatment measures will be implemented by a certified applicator according to herbicide label directions in accordance with applicable laws.

\* All road construction and harvest equipment will be cleaned of plant parts, mud and weed seed to prevent the introduction of noxious weeds. Equipment will be subject to inspection by forest officer prior



to moving on site.

\* All newly disturbed soils on road cuts and fills will be promptly reseeded to site adapted grasses to reduce weed encroachment and stabilize roads from erosion.



## **Lost Bear Watershed and Fisheries Report**

### **Issues**

- 1) Management activities associated with this project may increase water yield which could result in channel instability and increased sediment yield to stream channels.
- 1) New road construction, road use and timber harvest may increase sediment yield.

### **Watershed- Existing Conditions**

The proposed timber sale is located on two different school trust sections in Bear Creek and Fish Creek and several unnamed tributaries and discontinuous ephemeral draws. There is no direct conveyance of concentrated surface flow from these discontinuous ephemeral draws to the Blackfoot River. Fish creek and Bear Creek are both tributaries to the Blackfoot River. Ownership in these watersheds is a mixture of State Trust Lands, Plum Creek and private. The proposed harvest area in section 14 T14N, R14W lies within an unnamed tributary to Bear Creek. Bear Creek drains approximately 3746 acres. Harvest areas within the watershed are drained by the unnamed tributary as well as several well-defined ephemeral draws. Several of these draw features contain seeps and springs that feed short segments of perennial channel flow. However, there is no evidence of direct or continuous flow to Bear Creek itself. The draw features either open onto flat bench landscapes with dispersed overland flow or concentrated surface flows go subsurface while still confined in draw bottoms. There is no direct conveyance of concentrated surface flow from this area to the Blackfoot River. There are no stream channels or evidence of concentrated surface runoff in the segments of these draws within or immediately down slope of State ownership.

The proposed harvest area in section 36 T14N, R14W is located in the headwaters of the Fish Creek watershed. Fish Creek drains a watershed area of approximately 3064 acres. Flows are perennial in the upper portion of the watershed and intermittent in the lower watershed. There is one draw in the upper portion of the watershed that contributes perennial surface flow to Fish Creek. There are a few well-defined ephemeral draws that drain harvest areas in section 36. Stream flow is impounded in a series of small irrigation reservoirs located on the Potter ranch in the lower watershed. There is a man-made wetland in the headwaters that contributes surface flow to an unnamed tributary of Bear Creek.

Direct, indirect and cumulative effects as a result of past management activities are low to moderate. Historic timber harvest has increased water yield. However, existing channel conditions are good within the proposed project area. The stream channel is functioning properly and the banks are well vegetated and stable.

### **Water Quality Existing Conditions and Beneficial Uses**



Bear Creek and Fish Creek are classified B-1 in the Montana Surface Water Quality Standards. The B-1 classification is for waters that are considered suitable for domestic use after conventional treatment, as well as recreation, swimming and bathing. They are also suitable for growth and propagation of salmonid fish and other associated aquatic life, waterfowl, furbearers, agricultural and industrial water supplies. Another criteria for a B-1 classification is; no increases are allowed above naturally occurring concentrations of sediment, settleable solids, oils or floating solids, which will or are likely to create a nuisance or render the waters harmful, detrimental or injurious to public health, recreation, safety, welfare, livestock, wild animals, birds, fish, or other wildlife. Bear Creek and Fish Creek were not identified as a water quality limited water bodies by the 1996, 2000 or 2002 update to the Montana 303(d) list. Existing beneficial uses include cold water fisheries, irrigation and livestock watering.

Past management activities in the proposed project area include timber harvest, grazing, road construction and recreation. Existing and potential impacts due to direct, indirect and cumulative watershed effects were evaluated within the proposed project area. Existing water yield was calculated using the ECA methodology. Existing water yield increases in the unknown tributary to Bear Creek were found to be moderately high at 10.1%. However, channel inventories found stream channels in the project area to be in good condition, relatively stable and functioning properly. Normal sediment loads are being transported and the banks are well vegetated and stable. Fish Creek existing water yield increases were found to be low at 5%.

<b>Watershed</b>	<b>Existing ECA</b>	<b>Existing WYI</b>
Fish Creek	455ac	5%
Tributary to Bear Creek	1079 ac	10.1%

- \* Equivalent Clear Cut Area (ECA) is a function of total area roaded or harvested, % crown removal in harvest areas and the amount of vegetative recovery that has occurred in the harvest areas.
- \*\* % water yield Increase (%WYI) is the predicted increases in average annual water yield due to timber harvest and road construction.

Road densities within the proposed project area are moderate to high. Moderate to high road densities indicate increased risk potential for sediment reaching the stream channel and an overall increased sediment yield. Road densities were calculated in miles/section.

Section 36	3.4 miles
Section 14	4.4 miles

Some roads in the project area do not fully comply with BMP standards. A detailed evaluation of roads within the project area was conducted and it was determined that there is some sediment delivery from roads to the stream channel occurring at this time on specific sections of road, mainly those roads located immediately adjacent to streams



or at crossings. The proposed sale area is currently accessed by county and lower standard roads, of mixed ownership.

### **Effects on Water Quality**

#### **No Action Alternative**

Under the No Action Alternative, existing substandard roads with inadequate surface drainage would continue to impact water quality unless mitigations or remedial actions are taken.

#### **Action Alternative**

The primary risk to water quality is sediment delivery from roads, especially new road construction or at stream crossings. Under the Action Alternative approximately 1.9 miles of new road is to be constructed in section 36. Section 14 will have approximately 0.7 miles of new road construction. The DNRC would implement reasonable mitigations and erosion control practices during the design and construction of roads and stream crossings.

All existing roads planned for use and occurring on school trust land within the proposed project area were evaluated. Some roads in the project area do not fully comply with BMP standards. Existing roads would be improved to meet BMP standards and therefore improve long-term water quality. There are ephemeral draws and wet areas that lack discernable stream channels. Equipment restrictions and designated draw crossings would be utilized to protect all wet areas and ephemeral draws.

Short-term and long-term impacts to water quality would be minimal as a result of new road construction. There are no live streams in the proposed construction area and surface drainage would be installed to route surface flow to a sufficient buffer that would efficiently catch and filter any sediment. Site-specific designs and recommended mitigation measures would be implemented, resulting in minimal risk of direct and indirect effects.

In section 36, the headwaters of Fish Creek crosses an old roadbed with no crossing structure and is currently a sediment source to Fish Creek. This crossing would be reconstructed and a new culvert installed. A slash filter windrow would be installed over the outlet and rock armoring would be placed at the inlet and outlet. Stream channels would be well buffered from harvest units in sections 14 and 36. The Streamside Management Zone Law and Rules would be followed on all streams and wetland areas. Site-specific mitigations and erosion control measures during design and reconstruction of the stream crossing would result in minimal direct and indirect effects.

### **Cumulative Watershed Effects**



### No Action Alternative

Under the No Action Alternative cumulative effects would remain the same as a result of past management activities. However, these effects would most likely decline as hydrologic recovery occurs.

### Action Alternative

The results from the cumulative watershed effects analysis for the proposed action are summarized in the table below. Although the proposed water yield would increase 1.3% in the tributary to Bear Creek, stream channel conditions would accommodate this level of water yield increase (see channel stability characteristics in existing conditions).

Watershed	Existing ECA	Existing WYI	Proposed ECA	Proposed WYI	Threshold
Fish Creek	455 ac	5%	51 ac	Negligible	12% WYI
Trib. to bear Creek	1079 ac	10.1%	147 ac	1.3%	12%WYI

\* Equivalent Clear Cut Area (ECA) is a function of total area roaded or harvested, % crown removal in harvest areas and the amount of vegetative recovery that has occurred in the harvest areas.

\*\* % water yield Increase (%WYI) is the predicted increases in average annual water yield due to timber harvest and road construction.

No cumulative watershed impacts due to WYI are anticipated in the Fish Creek watershed due to the following reasons: 1) Negligible levels of water yield increases. 2) Lack of direct and continuous surface drainage features draining most of the proposed harvest area. 3) The relatively stable condition of the stream channel below the proposed sale area. 4) The presence of a substantial amount of canopy cover in the previously harvested area. 5) The success and advanced level of tree regeneration throughout the harvest area. 6) Selective nature of the proposed harvest prescription would generate only small amounts of ECA. The resulting water yield increases would be negligible. 7) The cumulative ECA and water yield increase are below the 12% threshold developed for the watershed by the DNRC hydrologist.

No cumulative watershed impacts are expected in the unnamed tributary to Bear Creek despite the moderate high level of estimated existing water yield increases. The risk of cumulative impacts occurring in Bear Creek as a result of the action alternative are low due to the following reasons: 1) There is no evidence of existing channel instability or other detrimental impacts due to increased water yields or increased peak flows in the drainage. 3) The drainage receives only a small amount of precipitation (average annual of 18-20"). 4) Most of the main drainage bottom does not contain a discernable stream channel. Those segments that do were evaluated and found to be in stable condition and do not appear to be susceptible to relatively small incremental increases in surface discharge. 4) The presence of residual canopy cover in the previously harvested areas. The success of tree regeneration throughout the harvested areas. 6) Selective nature of the proposed harvest prescription will retain a well-stocked healthy residual stand. This should result in



compensating effect as the remaining canopy utilizes most of the additional soil moisture on site. The cumulative ECA and water yield increase are below the 12% threshold developed for the watershed by the DNRC hydrologist.

The 12% threshold developed for both the Bear and Fish Creek watersheds was determined by assessing acceptable risk level, watershed sensitivity, resource value, stream channel conditions and riparian habitat conditions.

### **Fisheries Existing Conditions**

The Montana Department of Fish, Wildlife and Parks surveyed fisheries populations in Bear Creek during 1998. These surveys found westslope cutthroat trout, brook trout, rainbow trout and brown trout present from stream mile 0.0 to stream mile 5.7. The abundance of the population of resident westslope cutthroat is unknown. Brook trout, rainbow trout and brown trout are common. Both resident and fluvial populations of brown trout were found. Year round resident populations were found for brook trout. Rainbow trout use the stream primarily for spawning and rearing habitat.

There has been no fisheries information collected on Fish Creek. However, DNRC will assume fish are present in Fish Creek and appropriate mitigations would be implemented. Westslope cutthroat (WCT) have been listed as a Class A Species of Special Concern by the State. This Class A designation indicates limited numbers and/or limited habitats both in Montana and elsewhere in North America. The DNRC entered into a Conservation Agreement as a collaborative and cooperative effort among resource agencies, conservation and industry organizations, resource users and private landowners to protect WCT populations. The basic goal of this effort is to protect existing populations and ensure the long-term persistence of WCT populations within their historic range in Montana.

### **Fisheries Habitat- Effects of Proposed Action**

#### **No Action Alternative**

Under the No Action Alternative, direct, indirect and cumulative impacts to cold-water fisheries habitat through erosion and sedimentation as a result of existing road conditions would remain the same.

#### **Action Alternative**

There are no harvest units located immediately adjacent to Bear Creek or Fish Creek. There is sufficient buffer area between all proposed harvest units and stream channels draining into the proposed project area. Best Management Practices and Streamside Management Zone Laws and Rules would be implemented. Restricting or deferring harvest in the SMZ's and proposed stream and road crossing improvements are expected to result in no direct, indirect or cumulative impacts to cold water fisheries habitat.



### **Recommended Mitigation Measures**

- Comply with the Streamside Management Zone Law and Rules.
- Avoid skidding down draws and locate trails at least 25 feet out of draws or on natural breaks away from draws.
- Use existing trails on suitable grades and locations that meet BMP requirements. New additional trails would be located to meet minimum spacing requirements. Trails on steeper grades may require slash and/or grass seed following use, based on administrative review.
- Timber harvest would be designed to minimize overland flow, minimize soil erosion and displacement, and maintain water quality, through designated skid trails with 75 foot minimum spacing, adequate drainage on skid trails and proper log landing location and design.
- A majority of fine litter and slash should be left on site for nutrient cycling by in-woods processing or return skidding of slash.
- Existing roads would be inventoried and adequate drainage installed, to minimize water erosion and maintain water quality, by providing adequate surface drainage and properly installed and maintained stream crossings.
- A new culvert would be installed in section 36 in the headwaters of Fish Creek, to improve an unimproved stream crossing and reduce sediment input to the stream channel.
- Roads used for hauling where knapweed is present, should be sprayed to control weeds.



Michael T. McGrath, SWLO  
Wildlife Biologist  
17 March 2003

## Lost Bear Wildlife Analysis

### ISSUES

*The issues identified that drove the development of the Action Alternative are as follows-*

#### WILDLIFE:

**Big Game Considerations:** There is concern that this project could impact big game, especially elk security. Elk security is defined as a non-linear block of hiding cover  $\geq 250$  acres in size and  $\geq 0.5$  miles from any open road. Collectively these blocks must equal at least 30% of an analysis unit (Hillis et al. 1991). Thus, elk security is a function of cover and road density.

**Grizzly Bears:** There is concern that proposed timber harvest activities, such as road construction, disturbance, and cover removal may impact habitat and reduce security for grizzly bears.

**Lynx:** There is concern that the proposed timber harvest could alter habitat or create disturbance that would be detrimental to lynx.

**Gray Wolf:** There is concern that the proposed timber harvest may adversely impact wolves through reductions in security cover or alteration of habitat for prey species important for their survival.

*The issues identified that did not drive the development of alternatives-*

**Threatened, Endangered, Sensitive, and Other Species of Interest:** There is concern that the proposed timber harvest may alter habitat or create disturbance that would be detrimental to threatened, endangered, sensitive, and other species of interest that are not listed above.

## I. Existing Conditions

### A. General Description of the Project Area-

#### *Wildlife*

The DNRC ownership involved in this project provides a range of habitats for a diversity of wildlife species. Habitats are primarily drier forested uplands and interior forest types. The



predominant wildlife habitat values are winter range for big game species, lynx, and grizzly bears.

For wildlife-related issues, the “project area” consists of sections 14 and 36 in T14N R14W. The “analysis area” for most species’ cumulative effects follows ridgelines, draws, and main roads from Highway 200 southwest to Blacktail Mountain, south along the ridge upslope of Chamberlain Creek to the ridge running west upslope of Cap Wallace Gulch and Little Fish Creek, north along Sunset Hills road to Highway 200 (Fig. D1). This includes portions of the following sections: T15N R14W, sections 25, 34-36; T15N R13W sections 30, 31; T14N R13W sections 5, 6, 8, 17, 20, 29-32; T13N R13W sections 5-7; T13N R14W sections 3, 4, 10-12; T14N R14W sections 3, 4, 9, 16, 21, 28, 33.

The analysis area encompasses and considers the entirety, or portions thereof, of the following DNRC actions and proposed actions, in addition to industrial forest management on adjoining lands:

*Headquarters Timber Sale* (sections 2 and 10 T14N R14W, and section 36 T15N R14W)--The proposed action would use selective harvesting to favor retention of western larch and ponderosa pine in an effort to mimic natural fire disturbances. This action is planned for activity in late 2005.

*Little Fish Creek Timber Sale* (section 2 T13N R14W, and section 34 T14N R14W)--Between 1994 and 1997, 249 acres were thinned to produce uneven-aged stands after the removal of dying, diseased, and deformed trees.

*Haywire Wallace Timber Sale* (sections 2, 4, 10, 14, and 16 T13N R14W)--The proposed action would reduce the proportion of Douglas-fir within affected stands to mimic natural fire disturbances which would favor retention of western larch and ponderosa pine. The proposed action may construct up to 7 miles of road. This action is planned for activity in late 2004

*Sunset Hills Reciprocal Access Agreement* (hereafter SHRAA; sections 2, 3, 10 and 11 T13N R14W, and sections 10, 13-15, 23, 25-27, 33-36 T14N R14W)--The proposed action would grant Plum Creek Timberlands a permanent easement to use existing roads in sections 2, 10 T13N R14W, and sections 10, 14, 34 and 36 T14N R14W and on a new road segment to be constructed in sections 35 (0.2 miles) and 36 (0.5miles) T14N R14W. DNRC would obtain permanent access on existing roads on Plum Creek lands in the remaining sections as well as on a new road to be constructed in section 35 T14N R14W.

*Upper Blackfoot Reciprocal Access Agreement* (sections 2, 3, 9, 10 T14N R13W)--The proposed action would grant DNRC permanent easement along selected roads across Plum Creek Timberlands in these sections and elsewhere in the Blackfoot Valley, but outside of the analysis area. Plum Creek Timberlands would obtain permanent easement across DNRC lands along selected roads elsewhere in the Blackfoot Valley, but outside of the current analysis area.



## II Description of Relevant Affected Resources

### A. EXISTING ENVIRONMENT Big Game Considerations

#### Project Area

The project area is used extensively by the Chamberlain and Lindbergh elk herds, white-tailed deer, mule deer, and moose (Burcham et al. 1998). Each species has slightly different habitat requirements. Elk and deer generally avoid open roads, with elk becoming more tolerant of closed roads in the area over time (Lyon 1998). Densely stocked thickets of conifer regeneration and overstocked mature stands provide thermal protection and hiding cover for deer and elk in winter, which can reduce energy expenditures and stress associated with cold temperatures, wind, and human-caused disturbance. Additionally, extensive (e.g.,  $\geq 250$  acres) areas of forest cover  $\geq 0.5$  miles from open roads serve as security for elk. Thus, removing cover that is important for wintering deer through forest management activities can increase their energy expenditures and stress in winter. Reductions in cover could ultimately result in a reduction in winter range carrying capacity and subsequent increases in winter mortality within local deer herds.

Moose, however, are generally closely associated with riparian areas, feeding upon mesic shrubs. Moose use of habitats in proximity to any road, closed or open, differs based upon whether hunting season is in effect: during the non-hunting season, moose use habitats within 200 m of roads in greater proportion than their availability; during the hunting season, moose habitat use is negatively associated with proximity to any road, open or closed (Lyon 1998).

Within the project area, there are currently 7.8 miles of restricted use (i.e., gated and locked) roads, for a total of 3.9 miles of total road per square mile (simple linear calculation), and 1,045 acres of forest cover that could be used for snow-intercept cover. There are approximately 27 acres of forest cover within the project area (located in section 36) that could currently be used for security cover during the hunting season.

#### Analysis Area

Within the analysis area, there are 27 miles of open road, for a total of 0.72 miles of open road per square mile (simple linear calculation), and at least 65 miles of total road, for a total of at least 1.8 miles of total road per square mile (simple linear calculation). There are 15,014 acres of forest cover that could be used for snow-intercept cover, and approximately 3,255 acres of forest cover that could be used for security cover during the hunting season.

### B. EXISTING ENVIRONMENT Grizzly Bears

#### Project Area

Grizzly bears have recently moved into the area, utilizing riparian habitats and vegetation as well as shrub and berry fields in old harvest units (J. Jonkel, MT FWP, pers. comm., October 2002). This species is wide ranging in its movements, with home



ranges averaging 500 mi<sup>2</sup> in area. The project area is not located within a designated grizzly bear recovery zone. However, grizzly bears are a federally threatened species and are afforded protection from “take” under the Endangered Species Act. There are currently 7.8 miles of road within the project area, for a total of 3.9 miles of total road per square mile (simple linear calculation). There are no open roads within the project area due to locked gates on Bureau of Land Management and private lands.

### **Analysis Area**

The analysis area provides habitat for grizzly bears that have recently moved into the area. Repeated activity has been reported throughout the analysis area, with bear foraging activities focused in riparian areas, shrub and berry fields in old harvest units, and digging along mountain ridge tops (J. Jonkel, MT FWP, pers. comm., October 2002). The analysis area provides several habitats that are particularly attractive to grizzly bears, including: big game winter range areas, riparian zones, and abundant shrub fields. There are 65 miles of total road within the analysis area, for a total of 1.8 miles of total road per square mile (simple linear calculation). There are 27 miles of open road within the analysis area, for a total of 0.72 miles of open road per square mile (simple linear calculation). Therefore, both the analysis and project areas are relatively secure for grizzly bears due to the low open road densities.

## **C. EXISTING ENVIRONMENT Lynx**

### **Project Area**

Lynx are currently classified as threatened in Montana under the Endangered Species Act. In North America, lynx distribution and abundance is strongly correlated with snowshoe hares, their primary prey. Consequently, lynx foraging habitat follows the predominant snowshoe hare habitat, early- to mid-successional lodgepole pine, subalpine fir, and Engelmann spruce forest. For denning sites, the primary component appears to be large woody debris, in the form of either down logs or root wads (Koehler 1990, Mowat et al. 2000, Squires and Laurion 2000). These den sites may be located in regenerating stands that are >20 years post-disturbance, or in mature conifer stands (Koehler 1990, Ruediger et al. 2000).

Elevations in the project area range from 4,500 to 5,800 feet, and suitable habitat types (Pfister et al. 1977) for potential denning and foraging occur in the area. Within section 36, the lodgepole pine stand proposed for clearcut with reserves (stand 36-3) contains downed materials suitable for lynx denning, as well as stands proposed for commercial thinning (stands 36 – 2d and 36-2c). Snowshoe hares are important lynx prey and are associated with dense young lodgepole pine stands. There is a 36 acre densely regenerating seed tree cut, located between stands 36 -2d and 36-3, composed of approximately 40% western larch, and 20% each of lodgepole pine, Douglas-fir, and subalpine fir. The stand was recently pre-commercially thinned, however, the widely scattered, overstory seed trees are still present. Additional lynx habitat exists adjacent to the regenerating seed tree cut. DNRC stand level inventory (SL1) indicates that SL1 stand 15 (Fig. 2; adjacent to west of regenerating seed tree cut) has potential denning attributes, is located adjacent to a riparian zone, and is connected to a larger patch of



forested habitat that is characterized by older forest conditions and is an appropriate denning habitat type (subalpine fir/twinflower/twinflower). There are 361 acres of potential lynx habitat within the project area, all occurring in section 36. To date, there is no known lynx activity within the project area, however lynx have used regions of the southern portion of the analysis area (J. Squires, USFS, pers. comm., November 2002).

#### **Analysis Area**

The analysis area ranges in elevation from 3,800 to 6,300 feet, grading from low to higher elevations in a southeasterly direction, and contains roughly 4,800 acres of potential lynx habitat in sections 25, 35, and 36 T14N R14W, sections 1, 2, 11, and 12 T13N R14W, sections 19, 20, 30-32 T14N R13W, and sections 5-7 T13N R13W. All but 543 acres of potential lynx habitat reside on private industrial lands and Lubrecht Experimental Forest.

### **D. EXISTING ENVIRONMENT Wolves**

#### **Project and Analysis Areas**

Wolves are currently classified as threatened in Montana under the Threatened and Endangered Species Act. Wolf activity in the area is centered near Clearwater Junction and Potomac. Wolves immediately outside of the analysis area, however, did sire pups in 2002 (Joe Fontaine, USFWS, pers. comm. November 2002). Cover and road densities likely have some influence on wolf security. Currently, there are no open roads within the project area, and analysis area open road densities are estimated at 0.72 miles per square mile. Deer, elk, and moose are known to use the area.

## **III. Existing Environment for Issues That Did Not Drive Alternative Development**

### **A. EXISTING ENVIRONMENT Threatened, Endangered, Sensitive, and Other Species of Interest**

#### **Bald Eagle (Federally threatened)**

##### **Affected Environment**

#### **Project and Analysis Areas**

Bald eagles nest and roost in large diameter trees within 1 mile of open water. To date, bald eagles have been found to nest in the analysis area in section 31 T15N R13W (Montana Natural Heritage Database) and winter along the Blackfoot River. Large diameter ponderosa pine trees are present in both the project and analysis areas, and may be used by bald eagles for roosting and nesting. Roosting areas may be located miles from river and lake foraging areas. However, suitable nesting and roosting sites are located closer to or within sight of the river than those that occur in the project area. Bald eagles could also forage on carrion in the project and analysis areas. To date, no bald eagles have been reported nesting within 1 mile of the project area.

#### **Sensitive Species**

#### **Peregrine Falcon (recently de-listed from Federally threatened)**



## **Affected Environment**

### **Project and Analysis Areas**

Peregrine falcons are associated with tall cliffs and concentrations of waterfowl. Portions of the analysis area (section 36 T15N R14W, section 31 T15N R13W, and sections 1, 11 and 12 T14N R14W) have cliff habitat. Potential peregrine habitat generally includes cliff faces at least 164 feet tall, and the cliffs in the analysis area meet this criteria. To date, no peregrine falcons have nested or been seen in the project or analysis areas (Montana Natural Heritage Database).

### **Pileated Woodpecker**

#### **Affected Environment**

##### **Project and Analysis Areas**

Pileated woodpeckers likely occur in the project and analysis areas. Large-sized snags and downed material, essential habitat features for pileated woodpecker foraging and nesting, are scattered on the project and analysis areas. One 500 acre patch of suitable habitat in the analysis area occurs in section 36 T15N R14W, and birds were heard there during a field visit in July 1999 (by Rose Leach). Otherwise, recently-harvested portions of private industrial lands in the analysis area has little habitat for pileated woodpeckers because large diameter trees and snags were not retained.

### **Black-backed Woodpecker**

#### **Affected Environment**

##### **Project and Analysis Areas**

No recent stand-replacement burns or major insect infestations occur in the project or analysis areas. Lodgepole pine does occur throughout these areas, particularly in stand 36-3 in the project area, and the southeastern portion of the analysis area, for a total of approximately 2,456 acres (approximately 10%) of the 23,474 acre analysis area. The lodgepole pine is not infested with insects, and is of relatively small diameter. Thus, it would not serve as suitable habitat for black-backed woodpeckers. The Montana Natural Heritage Database reports that a transient or migratory black-backed woodpecker has been recorded for this general latitude and longitude.

### **Flammulated Owl**

#### **Affected Environment**

##### **Project and Analysis Areas**

The flammulated owl is a tiny forest owl that inhabits warm-dry ponderosa pine and cool-dry Douglas-fir forests in the western United States and is a secondary cavity nester. Nest trees in 2 Oregon studies were 22-28 inches dbh (McCallum 1994). Habitats used have open to moderate canopy closure (30 to 50%) with at least 2 canopy layers, and are often adjacent to small clearings. It subsists primarily on insects and is considered a sensitive species in Montana. Approximately 2,600 acres of potential flammulated owl habitat occurs on DNRC lands within the analysis area and 834 acres within the project area. Flammulated owls have not been reported as occurring within the ¼ latilong (Montana Bird Distribution Database), probably because few surveys have been done.



## **Boreal Owl**

### **Affected Environment**

#### **Project and Analysis Areas**

In Montana, over 85% of boreal owl observations were located in stands on subalpine-fir habitat types, 76% were located in mature or older stands, and their calls were not heard below 4200 feet elevation (Hayward et al. 1993). When multistoried forest is not available, boreal owls can occasionally be located in lodgepole pine stands when they possess trees  $\geq$  15 inches dbh, and trees  $>$  9 inches dbh that average 105 trees per acre (Hayward et al. 1993). Within the project area, 361 acres within section 36 have the potential to be suitable boreal owl habitat based on habitat type, average diameter, and elevation. Approximately 2,456 acres in the southeastern portion of the analysis area have the potential to be suitable boreal owl habitat.

## **Fisher**

### **Affected Environment**

#### **Project and Analysis Areas**

The fisher is a medium-sized animal belonging to the weasel family. Fishers prefer dense, lowland spruce-fir forests with high canopy closure, and avoid forests with little overhead cover and open areas (Coulter 1966, Clem 1977, Kelly 1977, Powell, 1977, 1978). For resting and denning, fishers typically use hollow trees, logs and stumps, brush piles, and holes in the ground (Coulter 1966, Powell 1977). Riparian areas in section 14 of the project area have been previously harvested, so stands with old growth attributes are not extensive. Habitat in section 36 of the project area appears to be more intact. Overstory cover remains more dense in project area riparian areas than surrounding habitats in the analysis area, which has been extensively harvested. Current low densities of coarse woody debris and large diameter snags in the project and analysis areas limit habitat value of both areas for the fisher.

## **Townsend's Big-eared Bat**

### **Affected Environment**

#### **Project and Analysis Areas**

Townsend's big-eared bats require caves, caverns, or old mines, habitat attributes that do not occur within the project and analysis areas, for roosting. As a result, the occurrence of this species is unlikely.

## **Other Sensitive Species**

The following are sensitive species that occur on lands administered by the Southwestern Land Office. We examined habitats in the project and analysis areas, and information in the Montana Natural Heritage Program, and Montana Bird Distribution Databases for each species. Due to limited available habitat and no confirmed records, we consider the species would not likely occur near the project area. Therefore, no direct, or cumulative effects are expected for any of these species as a result of either alternative.



**Coeur d’Alene Salamander**-This species requires waterfall spray zones, talus, or cascading streams. There are no known areas of talus, waterfalls, or splash zones within the analysis area. No known occurrences within the analysis area.

**Columbian Sharp-tailed Grouse**-No known populations of sharp-tailed grouse occur in the analysis area. Thus, no impacts to this species would be expected to occur.

**Common Loon**-The common loon is a fish-eating bird that breeds and nests on lakes and ponds. No lakes or ponds occur within the project or analysis areas. Thus, no impacts to this species would be expected to occur as a result of either alternative.

**Ferruginous Hawk**-Ferruginous hawks inhabit dry grassland, sagebrush plains, and saltbush/greasewood flats, which are absent from the analysis area. Additionally, no known populations of the species occur within the analysis area. Thus, no impacts to this species would be expected to occur as a result of either alternative.

**Harlequin Duck**-Harlequin ducks require white-water streams with boulder and cobble substrates for nesting and breeding. Potential habitat exists along the 8.9 miles of Blackfoot River within the analysis area. However, water quality would not be an issue with either alternative. Therefore no impacts to this species would be expected to occur.

**Northern Bog Lemming**-The northern bog lemming inhabits sphagnum meadows, bogs or fens with thick moss mats. No preferred habitat occurs in the project or analysis areas. Thus, there is no potential for effects to this species from either alternative.

**Mountain Plover**-The mountain plover inhabits short-grass prairie, alkaline flats, and prairie dog towns, habitat attributes that do not occur within the project or analysis areas. Thus, there is no potential for effects to this species from either alternative.

#### **IV. ENVIRONMENTAL CONSEQUENCES BY RESOURCE EFFECTS UPON DRIVER ISSUES**

##### **Big Game Considerations**

##### **Direct and Indirect Effects**

##### **No Action**

With no action, there would be no change from current conditions, with the exception of approximately 0.7 miles of new road that may be constructed under the Sunset Hills Reciprocal Access Agreement (see Sunset Hills Environmental Analysis for effects of road construction). There would be no short-term negative effect to moose, deer, and elk habitat. However, there could be a long-term negative effect by increased risk of stand-replacement fire.

##### **Action**

Harvest would occur in areas used by moose, white-tailed deer, mule deer, and elk. However, riparian habitats, which are preferred by moose, would not be entered in accordance with existing



SMZ law. Commercial thinning in section 14 would temporarily (approximately 20 years) reduce snow-intercept cover on winter range in the section from 590 acres to 146 acres for moose and mule deer, from 382 acres to 147 acres for white-tailed deer, and from 129 acres to 105 acres for elk. Elk, mule deer, and white-tailed deer do not have winter range habitat in section 36. In section 36, snow-intercept cover on moose winter range would be reduced from 434 acres to 306 acres through commercial thinning and clearcutting with reserves in units 36-2c-d and 36-3. These reductions in snow-intercept cover for moose in the project area have low likelihood of negative effects because moose in the project area are associated with mesic shrub and aspen habitat in winter, while avoiding wet coniferous forest (Burcham et al. 2000: Table 3).

Elk security cover would be reduced from 27 acres (2.1%) to 26 acres (2%) within the project area (all security cover is within the southern half of section 36). With the proposed construction of approximately 0.7 miles of new road under the Sunset Hills Reciprocal Access Agreement, the new road would eliminate security cover within the project area because the half-mile buffer (Hillis et al. 1991) associated with the proposed road would encompass current security habitat. However, all roads within the project area, including the new proposed SHRAA road segment, are closed to motorized access, but are open to hunters as a walk-in only hunting unit. Additionally, there would also be a reduction in hiding cover within the project area from 30% to 22% through the clearcutting with reserves of unit 36-3. This would reduce hiding cover from 382 acres to 281 acres within the project area. This would cause a short-term direct negative effect until regeneration within the clearcut with reserves would reach a height of 10 - 15 feet (approximately 10 - 15 years). No long-term negative effects are expected.

## **Cumulative Effects**

### **No Action**

With no action, there would be no change from current conditions, with the exception of approximately 0.7 miles of new road that would be constructed under the SHRAA (see Sunset Hills Environmental Analysis for effects of road construction). Construction of the new Sunset Hills road within sections 35 and 36 would eliminate elk security cover within the project area because new road would effect security habitat for a half-mile radius around it (Hillis et al. 1991). There would be no short-term negative effect to moose, deer, and elk habitat. There would be a gradual increase in risk of stand-replacement fire. This would be a long-term cumulative negative effect.

### **Action**

The proposed action would reduce elk security cover within the analysis area from 3,255 acres (13.9%) to 3,254 acres (13.9%). In conjunction with the Little Fish Creek Timber Sale and the proposed Headquarters timber sale, there would be a cumulative reduction in elk security cover from 13.9% to 13.7%, a low cumulative negative effect.

## **Grizzly Bears**

### **Direct and Indirect Effects**

#### **No Action**



With the no action alternative, there would be no change from current conditions, with the exception of the proposed construction of approximately 0.7 miles of new road within Section 36 under the Sunset Hills Reciprocal Access Agreement (see Sunset Hills Environmental Analysis for effects of road construction). With construction of the new road for Sunset Hills, total roads inside the project area would increase from 7.8 miles to approximately 8.5 miles, for a total of 4.25 miles of total road per square mile within the project area. There would be no increase in open road densities because access to the project area would be controlled by locked gates on private lands within the analysis area. Therefore, there is low likelihood for direct or indirect negative effects for this alternative.

### **Action**

Under the action alternative, approximately 573 acres would be selectively harvested, approximately 104 acres would be clearcut with reserves, and harvest operations would likely occur between June 1 and November 30. A riparian-like area, which is adjacent to stand 36-3 and would be deferred from harvest at this time, may provide visual screening cover for grizzly bears. The riparian-like area consists of a lodgepole pine overstory with dense alder shrubs in the understory. Additionally, a ridge in the northern portion of the unit could be used to break up sight distance for objects on the other side. With this mitigation and use of topography, only 15 acres of the 104 acre clearcut with reserves are further than 300 feet from hiding cover. Other mitigations to reduce the likelihood of negative effects on grizzly bears, in addition to minimizing distance to hiding cover, include (1) providing visual screening cover adjacent to the riparian area within the clearcut with reserves (unit 36-3), (2) managing food storage during harvest operations to minimize risk of bears obtaining food rewards, and (3) managing roads within the project area so that motorized access is through locked gates. While the Sunset Hill Reciprocal Access Agreement may be constructing approximately 0.7 miles of new road within section 36, the new road would be considered a closed road because motorized access would be controlled through a locked gate. Although 15 acres of unit 36-3 would be further than 300 feet from hiding cover for grizzly bears, other mitigations (e.g., closed roads, stringent sanitation guidelines, and riparian visual screening cover) would render a low likelihood of direct or indirect negative effects for grizzly bears within the project area.

### **Cumulative Effects**

#### **No Action**

With the no action alternative, there would be no change from current conditions, with the exception of construction of approximately 0.7 miles of new road within Section 36 under the Sunset Hills Reciprocal Access Agreement (see Sunset Hills Environmental Analysis for effects of road construction). With construction of the new road for Sunset Hills, total roads would increase from 65 miles to approximately 65.5 miles, for a total of 1.8 miles of total road per square mile within the project area. There would be no increase in open road densities because access to the project area would be controlled by locked gates on private lands within the analysis area. Therefore, there is low likelihood for cumulative negative effects for this alternative.

#### **Action**

The proposed action along with the proposed construction of the 0.7 miles of road under the Sunset Hill Reciprocal Access Agreement would cause minor disturbances for grizzly bears. However,



with mitigation, there would be slight negative cumulative effects, and little long-term negative effects to habitats important to grizzly bears. As a result of the proposed harvest in unit 36-3 (clearcut with reserves), vegetative response is likely to include growth of huckleberries (*Vaccinium* spp.), which are a preferred food source for grizzly bears. Within 10 - 15 years, vegetative response and tree regeneration would likely reach 10 - 15 feet in height in proposed harvest units and would likely serve as grizzly bear hiding cover. Additionally, all motorized access would be controlled through a locked gate on private lands, thereby maintaining open road density within the analysis area at 0.72 miles of open road per square mile (simple linear calculation). Therefore, both the analysis and project areas would be relatively secure for grizzly bears due to the low open road densities. Thus, there are slight negative cumulative effects, and low risk for long-term negative effects to habitats important to grizzly bears under this alternative.

## **Lynx**

### **Direct and Indirect Effects**

#### **No Action**

No change from current conditions would be expected with this alternative.

#### **Action**

Section 36 and adjacent sections are composed of habitat types suitable for potential denning and foraging by lynx. Additionally, unit 36-3, the unit proposed for clearcutting with reserves, does contain downed material suitable for lynx denning. However, 36-2c and 36 – 2d, which would be commercially thinned, also contain potential denning habitat and 36 – 2d is adjacent to a densely regenerating seed tree cut composed of 40% western larch, and 20% each of lodgepole pine, Douglas-fir, and subalpine fir. The stand was recently pre-commercially thinned. However, the widely scattered, over story seed trees are still present. Thus, potential denning and foraging habitat would still exist within section 36. Negative effects would be partially mitigated by:

1. Not harvesting stand level inventory stand 15 (16 acres; Fig. D2), a predominately Douglas-fir/lodgepole pine/subalpine fir stand with abundant downed wood for denning, and is adjacent to potential foraging habitat in the aforementioned densely regenerating clearcut.
2. Reducing the level of harvest in stand level inventory stand 18 (34 acres) such that more large live trees, snags, and coarse woody debris is retained than in the general commercial thin prescription that would be applied to units 36-1 and 36-2a-b.
3. The size of the planned clearcut in unit 36-3 was reduced from 110 acres to 101 acres, and moved away from the ridge top, to minimize fragmentation, provide riparian habitat, and to decrease potential negative effects to lynx habitat. Additionally, the riparian-like area in stand 36-3 should contain lynx foraging habitat due to the abundance of alder in the understory.

Thus, with mitigations in place, direct and indirect impacts to lynx would be reduced to a low potential for impact in the project area.

### **Cumulative Effects**

#### **No Action**

There would be no change from current conditions expected under this alternative.



### **Action**

Under the proposed action, approximately 157 acres of the roughly 4,800 acres of lynx habitat would be modified within the analysis area. Fifty-six of those acres would be commercially thinned, and the remaining 101 acres would be clearcut with reserves. Within the analysis area, the proposed action would modify lynx habitat on the northern fringe of the 4,800 acre block of habitat, serving to fragment the edge of habitat, but not affecting the interior core of lynx habitat within the analysis area. In the short term, 10 -15 years, the proposed clearcut would reduce the availability of potential denning habitat for lynx. However, in a longer time period (15 - 40 years post harvest), the clearcut would provide densely regenerating saplings in which lynx would forage for snowshoe hares. Additionally, the new foraging habitat would be well within reach of current lynx activity immediately to the south of the section (J. Squires, USFS, pers. comm. November 2002). With the aforementioned mitigations (see Project Area description) implemented, there would be low potential for the proposed action to impact lynx within the analysis area because potential denning and foraging habitat and would still be present in the project and analysis areas.

### **Gray Wolf**

#### **Direct and Indirect Effects**

##### **No Action**

No changes from current conditions are expected under this alternative.

##### **Action**

Gray wolves could use the project area, although there are no documented dens in the project area (Joe Fontaine, USFWS, pers. comm., November 2002). The two sections within the project area are relatively secure because all roads are closed due to locked gates on private lands controlling access. Because of the project area's inaccessibility due to gated and locked roads, and concentrations of big game, the project area would be attractive to gray wolves. Additionally, the proposed action would likely stimulate forage production and potentially augment big game populations in the short term. Thus, there would be low potential for direct or indirect negative effects to gray wolves.

#### **Cumulative Effects**

##### **No Action**

No changes from current conditions are expected under this alternative.

##### **Action**

Gray wolves could use the analysis area, although there are no documented dens in the analysis area (Joe Fontaine, USFWS, pers. comm., November 2002). Most of the analysis area is relatively secure, with an open road density of 0.72 miles of open road per square mile, and at least 38 miles of closed road in the analysis area due to locked gates on private lands controlling access. Because of the analysis area's inaccessibility due to gated and locked roads, and concentrations of big game, the area would be attractive to gray wolves. Additionally, the proposed action, in connection with the proposed Headquarters and Haywire Wallace timber sales would likely stimulate forage



production and potentially augment big game populations in the short term. Thus, there would be low potential for cumulative negative effects to gray wolves.

## **EFFECTS UPON NON-DRIVER ISSUES**

### **Effects upon Endangered, Threatened, Sensitive, and Other Species of Interest**

#### **No Action**

There would be no direct, indirect, or cumulative effects to bald eagles, peregrine falcons, flammulated and boreal owls, fisher, Townsend's big-eared bats, Coeur d'Alene Salamanders, Columbian sharp-tailed grouse, common loons, ferruginous hawks, harlequin ducks, northern bog lemmings, or mountain plover due to their absence from the area. For bald eagles, there would be no change from current conditions under this alternative.

#### **Action**

There would be no direct, indirect, or cumulative effects to bald eagles, peregrine falcons, flammulated and boreal owls, fisher, Townsend's big-eared bats, Coeur d'Alene Salamanders, Columbian sharp-tailed grouse, common loons, ferruginous hawks, harlequin ducks, northern bog lemmings, or mountain plover due to their absence from the area. For bald eagles nesting west of the analysis area there would be no change from current conditions under this alternative because the proposed haul route would be over 0.5 miles from the nest.

### **Pileated Woodpecker**

#### **Direct and Indirect Effects**

##### **No Action**

There would be no change from current conditions under this alternative.

##### **Action**

Some large Douglas-fir would be removed from the project area, a direct and indirect negative effect to this species. However, negative effects would be partially mitigated by leaving some areas unharvested and retaining large ponderosa pine and western larch. As trees grow larger, there would be a long-term benefit to pileated woodpeckers because the larger trees would grow to become potential nest trees. Thus, there is low potential for direct and indirect negative effects to pileated woodpeckers in the project area.

#### **Cumulative Effects**

##### **No Action**

There would be no change from current conditions under this alternative.

##### **Action**

Some large Douglas-fir would be removed from the project area, in addition to the harvesting that has occurred on industrial lands within the analysis area, a cumulative negative effect to this species. However, negative effects would be partially mitigated by leaving some areas unharvested



and retaining large ponderosa pine and western larch in the project area, and within the proposed Headquarters Timber Sale, which would return those proposed units to historic open ponderosa pine and western larch stands. As trees grow larger, there would be a long-term benefit to pileated woodpeckers because the larger trees would grow to become potential nest trees. Thus, there is low potential for cumulative negative effects to pileated woodpeckers in the analysis area.

### **Black-backed Woodpecker**

#### **Direct and Indirect Effects**

##### **No Action**

With no harvest, risk of stand-replacement fires would increase. If a stand-replacement fire occurred, black-backed woodpecker habitat would be created, a direct and indirect benefit to habitat for this species. Therefore the potential benefit to black-backed woodpecker habitat by the no action alternative exists.

##### **Action**

With the proposed harvest, risk of stand-replacement fire and insect infestation, is decreased. Reduced fire risk would be a direct and indirect negative effect to potential black-backed woodpecker habitat. Negative effects would be partially mitigated by retaining trees in 665 acres of unharvested stands within the 1280 acre project area. With harvest, tree density would remain at least 50 trees per acre, so that the area would be potential suitable black-backed woodpecker habitat post-harvest. Thus, there is low potential for negative, direct or indirect effects to this species.

#### **Cumulative Effects**

##### **No Action**

With no harvest, risk of stand-replacement fires would increase. If a stand-replacement fire occurred, black-backed woodpecker habitat would be created, a cumulative benefit to habitat for this species. Therefore the potential benefit to black-backed woodpecker habitat by the no action alternative exists.

##### **Action**

With the proposed harvest, risk of stand-replacement fire and insect infestation, is decreased. Reduced fire risk would be a direct, indirect, and cumulative negative effect to potential black-backed woodpecker habitat. Negative effects would be partially mitigated by retaining trees in 665 acres of unharvested stands within the 23,474 acre analysis area. Thus, there is low potential for negative cumulative effects to this species.



## Literature Cited

- Burcham, M., C. L. Marcum, L. J. Lyon, K. T. Weber, and, W. D. Edge. 1998. Final report: Chamberlain Creek elk studies 1977-1983 and 1993-1996. School of Forestry, University of Montana, Missoula. 260 pp.
- Burcham, M., C. L. Marcum, D. McCleerey, and M. Thompson. 2000. Final report: study of sympatric moose and elk in the Garnet Range of western Montana, 1997-2000. School of Forestry, University of Montana, Missoula. 85 pp.
- Clem, M. K. 1977. Food habits, weight changes and habitat use of fisher *Martes pennanti* during winter. M.S. Thesis. University of Guelph, Guelph, Ontario. 49 pp.
- Coulter, M. W. 1966. Ecology and management of fishers in Maine. Dissertation. Syracuse University, Syracuse, New York. 183 pp.
- Hayward, G. D., P. H. Hayward, and E. O. Garton. 1993. Ecology of boreal owls in the northern Rocky Mountains, U.S.A. Wildlife Monographs 124:1-59.
- Hillis, J. M., M. J. Thompson, J. E. Canfield, L. J. Lyon, C. L. Marcum, P. M. Dolan, and D. W. McCleerey. 1991. Defining elk security: the Hillis paradigm. Pp. 38-43 in A. G. Christensen, L. J. Lyon, and T. N. Lonner, compilers, Proceedings of the Elk Vulnerability Symposium, Montana State University, Bozeman, Montana. 330 pp.
- Kelly, G. M. 1977. Fisher (*Martes pennanti*) biology in the White Mountain National Forest and adjacent areas. Dissertation. University of Massachusetts, Amherst. 178 pp.
- Koehler, G. M. 1990. Population and habitat characteristics of lynx and snowshoe hares in north central Washington. Canadian Journal of Zoology 68:845-851.
- Lyon, L. J. 1998. Elk habitat selection at a site specific scale. Pp. 49-72 in M. Burcham, C. L. Marcum, L. J. Lyon, K. T. Weber, and, W. D. Edge (eds.). Final report: Chamberlain Creek elk studies 1977-1983 and 1993-1996. School of Forestry, University of Montana, Missoula.
- McCallum, D. A. 1994. Flammulated owl (*Otus flammeolus*). In The birds of North America, No. 93: A. Poole and F. Gill (eds.). The birds of North America, Inc., Philadelphia, Pennsylvania.
- Mowat, G., K. G. Poole, and M. O'Donoghue. 2000. Ecology of lynx in northern Canada and Alaska. Pp. 265-306 in Ruggiero, L. F., K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires (eds.). Ecology and conservation of lynx in the United States. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-GTR-30WWW.



- Pfister, R. D., B. L. Kovalchik, S. F. Arno, and R. C. Presby. 1977. Forest habitat types of Montana. USDA Forest Service General Technical Report INT-34. 174 pp.
- Powell, R. A. 1977. Hunting behavior, ecological energetics and predator-prey community stability of the fisher (*Martes pennanti*). Dissertation. University of Chicago. 132 pp.
- Powell, R. A. 1978. A comparison of fisher and weasel hunting behavior. *Carnivore* 1:28-34.
- Ruediger, B, J. Claar, S. Gniadek, B. Holt, L. Lewis, S. Mighton, B. Naney, G. Patton, T. Rinaldi, J. Trick, A. Vandehey, F. Wahl, N. Warren, D. Wenger, and A. Williamson. 2000. Canada lynx conservation assessment and strategy. U. S. Department of Agriculture, Forest Service, Missoula, Montana. R1-00-53. 142 pp.
- Squires, J. R., and T. Laurion. 2000. Lynx home range and movements in Montana and Wyoming: preliminary results. Pp. 337-349 in Ruggiero, L. F., K. B. Aubry, S. W. Buskirk, G. M. Koehler, C. J. Krebs, K. S. McKelvey, and J. R. Squires (eds.). *Ecology and conservation of lynx in the United States*. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-GTR-30WWW.



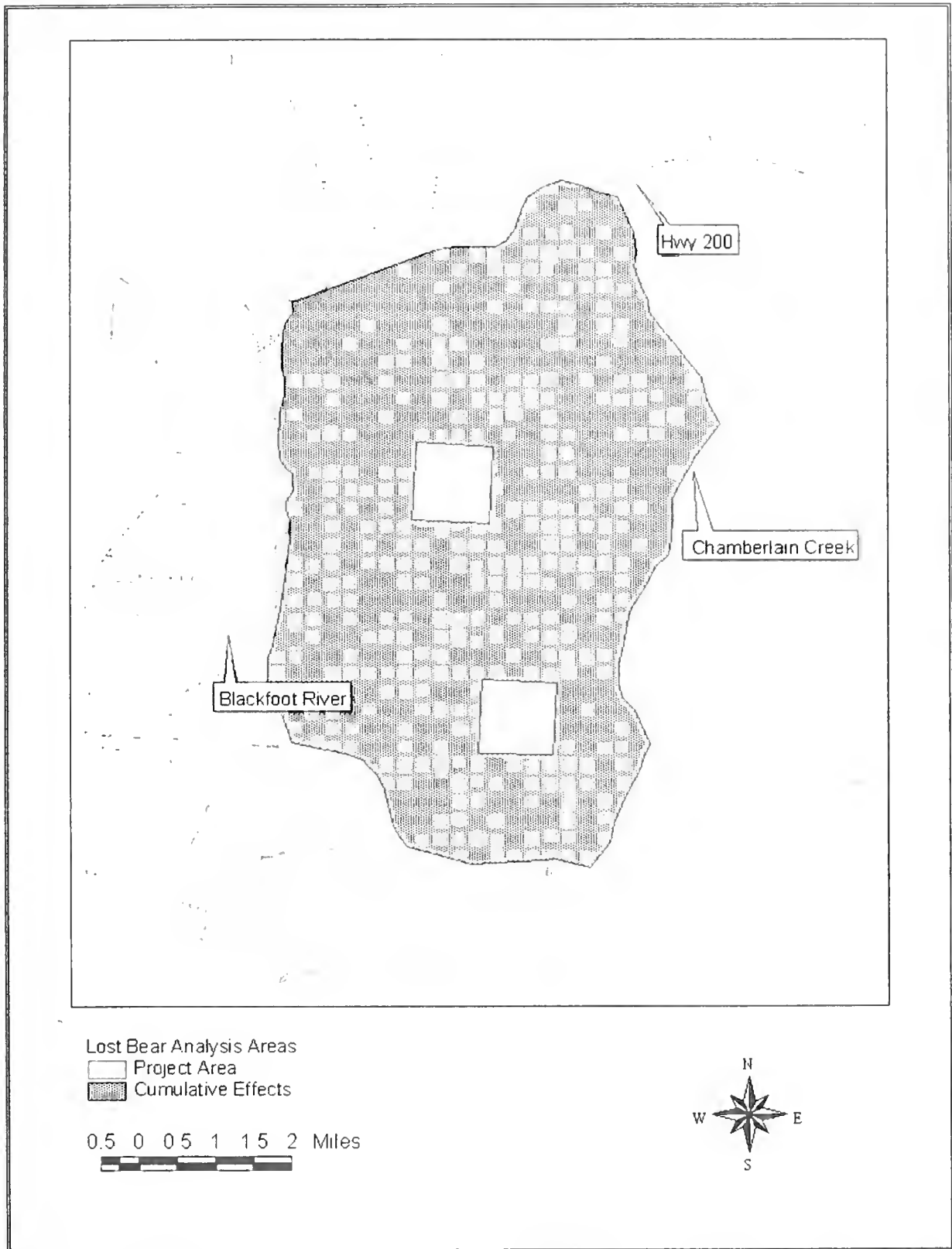


Figure D1. Lost Bear analysis areas.



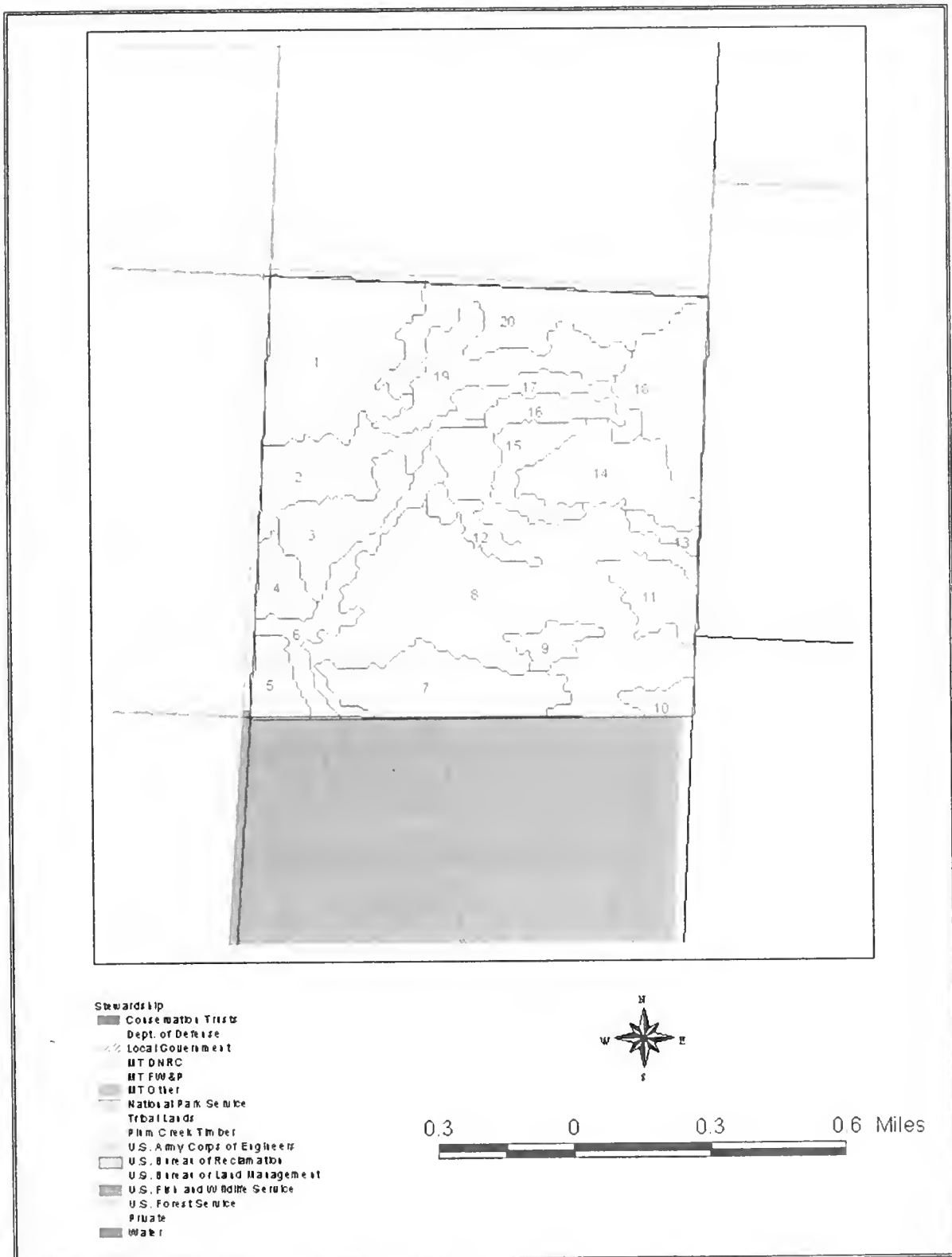


Figure D2. Map of Montana DNRC stand level inventory stands within section 36 T14N R14W.



## Economic Analysis for the Lost Bear Timber Sale

- a) Costs, revenues, and estimates of return are just estimates intended for relative comparison of alternatives. They are not intended to be used as an absolute estimate of return.
- b) The estimated stumpage is based on comparable sales analysis. This method compares recent sales to find a market value for stumpage. These sales have very similar species, quality, average diameter, product mix, terrain, date of sale distance from mills, road building and logging systems, term of the sale or anything that could affect a buyer's willingness to pay for stumpage. The estimated stumpage price (\$ / MBF) for the lower end of the range equals approximately \$115.00 (Clearwater River #3 Timber Sale) and conversely, \$249.00 (Cramer Creek Timber Sale) at the upper end of the range. These two comparable timber sales were sold based on tons. Six and one half tons per MBF was used to convert from tons to MBF.
- c) The estimated gross revenue for the trust for an alternative is calculated by multiplying the estimated stumpage price by the total estimated volume. The state also collects money for forest improvement. The estimated total collected FI amount equals the FI rate multiplied by the estimated volume. The following table displays the estimated range of gross revenue to the state by alternative from this proposed sale, estimated range of collected FI fees and the estimated post treatment cost for tree planting, and slash burning (broadcast and piles).

Table 1.0 Estimated Total Collected FI Fee, the estimated cost for Planting and Slash Burning, and the estimated Gross Revenue to the Trust by alternative from the proposed timber sale.

	No Action	Action	
Est. Total Volume (MBF)	0	3,000	
Est. Total Collected FI Fee (\$34.90 / MBF)	0	\$104,700	
Est. Planting, Slash Burning (Piles and Broadcast)	0	\$45,375	
		Low	High
Est. Gross Stumpage	0	\$345,000	\$747,000

- d) The costs related to the administration of the timber sale program are only tracked at the Land Office and Statewide level. DNRC does not keep track of project level costs for individual timber sales. The following table displays the revenue-to-cost ratios for the State and Southwestern Land Office. The revenue-to-cost ratios are a measure of economic efficiency. A ratio value less than 1.0 means that the costs are higher than revenues (losing money). A



ratio value greater than 1.0 means that the revenues are higher than costs (making money). A ratio value equaling 1.0 means that costs are equal to revenues.

Table 2.0 Revenue-Cost Ratios Statewide and for the Southwestern Land Office.

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
SWLO	2.08	1.83	1.23	2.36	2.69	2.57
State	1.98	1.72	1.36	2.78	1.62	1.75

- e) The proposed forest treatment is consistent with the objectives identified in the Omega alternative selected in the State Forest Land Management Plan. As such, it endeavors to manage the forest for biodiversity. In managing for biodiversity the expectation is that the maximum amount of non-market value consistent with the Enabling act is provided.





